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DEPEND ON YOURSELF.

God educates men by casting them upon their own resources. Man learns to swim by being tossed into life's maelstrom and left to make his way ashore. No youth can learn to sail his life-craft in a lake sequestered and sheltered from all storms, where other vessels never come. Skill comes through sailing one's craft amidst rocks and bars and opposing fleets, amidst storms and whirls and counter-currents. Responsibility alone drives man to toil and brings out his best gifts.—Newell Dwight Hillis.

Telephone Transmission and Standard Cable Equivalents.

Telephone transmission is a subject about which the average telephone man is not well informed. He has a hazy idea of the meaning of "standard cable" but usually thinks of it as something theoretical and not for practical use in his exchange. If asked about the transmission over certain subscribers' loops or toll lines, the reply is usually that it is good or bad. In other words there is nothing definite in the answer, it being only general in character.

Telephone lines differ in their transmission qualities and in order to compare or express their efficiencies to a definite degree, there must be a standard unit used as a basis of comparison. The unit used for such purpose is a loop circuit of one mile of lead covered cable having paper insulated copper conductors. It has a certain specified conductor resistance, mutual electrostatic capacity and insulation resistance. Comparison is made by talking over a circuit to be composed and then switching rapidly over to a circuit of artificial adjustable standard cable. The standard cable is adjusted until the volume of the sounds transmitted over artificial are equal to that over the actual circuit.

If speech, transmitted over five miles of an actual circuit has the same loudness as if transmitted over two miles of standard cable, the equivalent of the circuit is said to be two miles. If another five mile circuit has an equivalent of three miles, its transmission efficiency is evidently less than that of the first circuit. Hence the higher the standard cable equivalent of a circuit, the lower its efficiency. Therefore, the efficiency of any circuit is readily determined when its transmission value is expressed in terms of a standard cable. On other pages of this issue Mr. Cavers shows how various toll or long distance circuits may be equated or reduced to standard cable equivalents and the uses which may be made of such calculations.

Publicity Now a Necessity.

More and more are the officials of public utility companies coming to realize that publicity should not be an enforced virtue, but rather one which should be eagerly assumed. The following statement of W. F. Ham, vice-president of the Washington (D. C.) Railway-Electric Co., is but one indication of the trend of present-day thought along those lines.

"Officials of public service corporations can no longer afford to shut themselves within locked doors and tell the public it is none of their business to know what they are doing or how they are doing it," Mr. Ham is quoted as saying.

"It is unfortunate for the public utility companies themselves that recognition of the necessity of publicity did not come earlier. They have suffered through a misconception on the part of the public of their true earning power. The public has believed them enormously profitable, which belief it is possible the companies themselves shared, through mistaken notions of the true costs of operation arising in large part from the rapidity of the growth of the industry.

"The public has a right to know what their utility companies are doing. The companies will profit by giving their patrons full and impartial reports of their doings"

Given a telephone company properly and conservatively financed and managed along normal and progressive lines, nothing so strongly and definitely make for its well-being as playing the game with all cards above the table.

Grow a Spine and Make Good

By HERBERT KAUFMAN

When you're down in the dumps and the sun's rays are blue—when your bank account's short and your face is long, and you've quite made up your mind that you haven't a ghost of a show—

When you've run the gamut of your friends and worn out their patience and your credit—when you can't find a living soul who is willing to help you and you're sure that the game is up—

When you've tried to get work, and the only work that you can find is the work of looking for it—when you've reached the stage where all life has assumed a lemon flavor and the future tastes like a mouthful of lye—

When you're sure that nothing is worth while, and you've begun to believe that the world has gone wrong, and that you're a football on the field of fortune with the whole universe on the eleven—

Then it's time to remember that Helen Keller made good.

Put down your assets in one column and list hers beside it. Then let's strike a balance.

Huh! Why, you're rich.

You have eyesight and hearing and speech. Your limbs are sound. You can use your arms and your legs and your hands as freely as ever. What in creation are you waiting about, you weak-kneed welcher!

O, don't start cataloging your trials and afflictions. They don't weigh as much as a feather when you hold them in the scales against those of a girl the mention of whose name should bring the blush of shame to the cheeks of every man who has his health and fails.

Without eyes, she learned to read. She never heard a violin or the glory of a great voice. Her tongue never framed a question. All the things that her brain yearned to know were walled away from her.

And yet she made good simply because she wasn't a quitter. What Nature would't give her she gave herself.

And you who have everything that counts—all the tools of success—all the unbuyable gifts of Providence—wealth that the gold of a strongbox couldn't purchase from you, even at this hour—you are bawling!

You deserve failure. You're a coward.

There's a chance for every man in the land, but you haven't spunk enough to take yours.

The prairies are yearning to become farms—the rivers are eager to turn mill wheels—the cities are breeding new neighborhoods—millions of peasants, ignorant of one English word—without skill, but with doggedness to take its place—are earning bread and buying homes.

You can't be helped because you're a jellyfish. If you were lifted up you'd flop back like a soggy sponge.

Start in and grow a spine. Wade out of your self-pity and your false pride. Dig through your cowardice and your fear and find the man in yourself.

Try again and keep trying; try as hard as the blind girl tried.

If one spot is too crowded, go where they need a crowd. If one resource fails you, invent another.

This is the land of better tomorrows. Give yourself half the chance that you demand of society, and society will soon wear a path to your door.

Copyright by Herbert Kaufman.

Use of Standard Cable Equivalents in Long Distance Practice

The Determination of the Transmission Values of Toll Lines by the Application of Standard Cable Equivalents and Their Use in the Planning of New Lines—The Total Equated Length of a Line and How to Find It

By James Cavers

This article deals with the application of standard cable equivalents to the determination of the transmission value of long distance lines and their adaptability to the design of new circuits.

The standard cable with which the type of wire herein referred to is compared, is a cable in which the mutual electrostatic capacity between the wires of a pair is 0.054 microfarads, the mutual inductance between the wires of a pair 0.001 henries, the loop resistance 88 ohms and the mutual insulation resistance between wires of a pair not less than 200 megohms; all the values being for a length of one mile.

Type.	Mutual Capacity per Mile in Microfarads.	Miles Equivalent to One Mile of Std. Cable.
No. 22 B. & S. gage cable circuit...	0.069	0.627
No. 19 B. & S. gage cable circuit...	.073	.791
No. 19 B. & S. gage cable circuit...	.054	1.000*
No. 16 B. & S. gage cable circuit...	.072	1.260
No. 13 B. & S. gage cable circuit...	.072	1.883
No. 10 B. & S. gage aerial cpr. wire		12.600
No. 8 B. & S. gage aerial cpr. wire		18.320
No. 8 B. W. G. gage aerial cpr. wire		28.737

*Standard Cable.

Table No. 1. Cable and Aerial Wire in Terms of Standard Cable.

The lengths of various kinds of line which will give transmission equal to one mile of the above described standard cable are shown in Table No. 1, these lengths being known as the transmission equivalents of the types of line referred to. All the equivalents of the kinds of line in general use are not given, as they are not necessary for the purpose of this article and also are well known. Table No. 2 shows the reciprocals of the equivalents given in Table No. 1, these reciprocals being referred to in general practice as multipliers.

By dividing the length of any line by the equivalent of its kind, the resultant will be its transmission value in terms of standard cable, or in other words, would be the number of miles of standard cable, which spoken over, would give transmission equal to the line itself. Multiplying the length of line by the reciprocal equivalent of its kind would give the same result, this latter method being as a rule, the most convenient.

The value obtained by dividing a line by its equivalent or multiplying by the reciprocal of the equivalent, is known as the equated length of that line. To illustrate this, consider a line 200 miles long, composed of No. 10 B. & S. copper. Multiplying the length of line by 0.079, taken from Table No. 2, will give 15.8, this being the equated length.

Lines are frequently made up of various kinds of wire. In such cases it is necessary to multiply the length of each kind by the proper reciprocal, the results being added to give the total equated length. The following examples clearly illustrate the process.

It is desired to find the total equated length of a line is made up as follows:

100.6 miles No. 10 B. & S. copper wire
20.0 miles No. 8 B. & S. copper wire
2.0 miles No. 16 B. & S. cable circuit.

From Table No. 2 reciprocals of the wire and cable equivalents in terms of the standard cable are taken for each size wire and cable. Then multiplying out the various distances and reciprocals, the results are as follows:

Length in miles	Equated length
100.6	100.6 x .079 = 7.95
20.0	20.0 x .055 = 1.10
2.0	2.0 x .790 = 1.58
	Total equated length = 10.63

As another example, the total equated length is calculated for a circuit made up of:

500.0 miles No. 8 B. W. G. copper wire
6.2 miles No. 13 B. & S. cable circuit
0.5 mile No. 16 B. & S. cable circuit
1.0 mile No. 22 B. & S. cable circuit

Proceeding as in the previous case, the results are:

Length in miles	Equated length
500.0	500.0 x .035 = 17.500
6.2	6.2 x .53 = 3.286
0.5	0.5 x .79 = 0.395
1.0	1.0 x 1.59 = 1.590
	Total equated length = 22.771

By the adoption of standards for local and long distance lines and other miscellaneous circuits, the determination of the losses due to apparatus and the application of these values, a definite scheme can be made up for any defined territory. It must be borne in mind that there is always a certain loss due to the apparatus, such as cords, relays, etc., in the talking circuit and such values must be allowed for in arriving at the transmission efficiency of any line. It is not within the scope of this article to deal specially wtih losses due to apparatus. The value of such losses may be arrived at by means of special testing equipment and the results so obtained, are near enough for practical purposes.

It is very important that transmission over long distance lines be such that easy commercial conversation be maintained, no matter what line and apparatus, or combination of lines and apparatus, be included in the talking circuit. Taking 32 miles of standard cable as the limit allowable for easy commercial conversation, the transmission efficiency would not be up to the standard if, in a certain connection, the long distance line equated at 32 miles and the trunks and subscriber's lines at 5 miles. The whole apparatus and lines in the talking circuit must be taken into account when determining the transmission value.

Type.	Reciprocals.
No. 22 B. & S. gage cable circuit	1.59
No. 19 B. & S. gage cable circuit	1.26
No. 19 B. & S. gage cable circuit	1.00*
No. 16 B. & S. gage cable circuit	.79
No. 13 B. & S. gage cable circuit	.53
No. 10 B. & S. gage aerial copper wire	.079
No. 8 B. & S. gage aerial copper wire	.055
No. 8 B. W. G. gage aerial copper wire	.035

*Standard Cable.

Table No. 2. Reciprocals of Cable Equivalents.

In designing new lines, provision should be made for future re-

quirements. If a line is in the future to be extended, the question of transmission value for the whole line, should be dealt with when the first portion is built. In many cases the extended portion can be connected to a phantom and money can be saved by dealing properly with matters of this kind.

Phantom lines should be made use of whenever possible. Where the circuits are properly transposed they will be found to work very satisfactorily. Where a new line is being erected and a line already exists, new and old lines should be so placed that a phantom can be built up on them when desired. The longest lines should be, in comparison with their length, of the highest transmission value. It is good policy, where long lines are not wholly phantom, to partly build up the circuit in this way. The transmission over the phantom portion will be better than over the same length of physical circuit on which the phantom is built up. As an example, suppose that two lines of No. 10 B. & S. copper run on the same lead together for a distance of 100 miles, one line being extended for a considerable distance beyond the other. Say that the equated length of the longest line is 26 miles and of the shorter 7.9 miles. A phantom is built up, by means of repeating coils, between the points where the lines run together. As the introduction of the coils will lower the transmission value of the physical circuits and bring the longer line near to the commercial limit, the phantom should be connected to the latter circuit, making this line more efficient in transmission value than before.

The use of standard cable measurements provides a ready means of ascertaining the most economical type of construction. There are, for instance, cases where a No. 10 B. & S. copper circuit is barely heavy enough to come within the transmission standard adopted, and where it is necessary to run a heavier wire for part of the way. Under such condition it is necessary to obtain the length of each kind of circuit required. Knowing the length of the route and the equated length agreed upon, the necessary particulars are easily obtainable from the formula given below where

A = length of line of lighter type
B = length of line of heavier type
a = reciprocal equivalent of lighter type
b = reciprocal equivalent of heavier type
C = length of route
D = equated length desired

$$A = \frac{D\,(C \times b)}{a-b}$$

Consider as an example, a line 200 miles long and the equated length desired being 14 miles. Multiplying 200 by .079, the reciprocal for No. 10 B. & S. copper, will give an equated length of 15.8 miles, and multiplying 200 again by .055, the reciprocal for No. 8 B. & S. copper, will give an equated length of 11 miles. In one case, the transmission is under and in the other above the standard. A combination of the two types could be adopted.

From the formula, $A = \frac{14\,(200 \times .055)}{.079 - .055} = \frac{3}{.024}$ = 125 miles No. 10 B. & S. copper

Then $B = 200 - 125 = 75$ miles No. 8 B. & S. copper.

On multiplying these lengths by the respective reciprocals, the total equated length will be found to be 14 miles. The line could therefore be run with 125 miles of No. 10 B. & S. copper wire and 75 miles of No. 8 B. & S. copper.

Records should be kept of the equated lengths of the various lines in a territory and when any alteration, affecting the transmission, is contemplated, the effects of such alteration should be carefully investigated.

A Word on Routing.

Great care should be exercised in routing calls, so that they will be sent over circuits that will give standard transmission. Much business is lost due to poor routing arrangements and were routing is well taken care of it pays the company concerned. Poor transmission means dissatisfied patrons and, if not remedied, loss of prestige and money. No company should accept calls to points between which they know satisfactory conversation cannot be maintained. It wastes the calling party's and the company's time and money.

Maintenance.

The equivalents shown are for lines in first class condition. Broken insulators, poorly insulated bridle wires, and untrimmed trees are prolific sources of poor transmission. To get the best results a high standard of maintenance should be aimed at.

Dividend Showings in New York State.

Records compiled from the office of the New York Public Service Commission for the year ended June 30, 1912, show that telephone corporations with a gross revenue of $25,000 a year or more paid dividends to the amount of $31,735,700 on their common stock and $8,944 on their preferred stock. The companies were as follows:

	Per cent. Common	Per cent. Pref.
Albany Home Telephone Co	4	..
American Telephone & Telegraph Co	8	..
Cohoes-Waterford Home Telephone Co	4	..
Commercial Union Telephone Co	5	3
Glen Telephone Co	6	..
Granville Telephone Co	2	..
New York Telephone Co	8	..
Orange County Telephone Co	8	6

Telephone corporations showing gross revenues of less than $25,000 paid dividends as follows:

	Per cent.
Ashville & Panama Telephone & Telegraph Co	8
Baiting Hollow & Roanoke Telephone Co	4
Catskill Mountain Telephone Co	5 and 7
Cayuga, Onodaga Telephone Co	3
Cazenovia Telephone Co	10
Columbia & Rensselaer Telephone & Telegraph Co	4
Darien Telephone Co	6
Dunkirk & Fredonia Telephone Co	6
Dunkirk Home Telephone Co	6
Eden Telephone Co	10
Highland Telephone Co	6
Hilton Telephone Co	6
Marquis Telephone Co	5
Mayville Telephone Co	4
New Lisbon Farm Telephone Co	6
North Creek Telephone Co	5
Oneida County Rural Telephone Co	6

Telephone corporations having gross revenues of less than $10,000 show dividends as follows:

	Per cent.
Pioneer Telephone Co	6
Port Byron Telephone Co	8
Port Henry Telephone Co	10
Port Jervis Telephone Co	6
Ripley Telephone Co	4.5
Seneca-Gorham Telephone Co	6
Sherman Telephone Co	8
State Telephone Co	5
Suffolk County Telephone Co	6
Ticonderoga Home Telephone Co	6
Union Telephone Co	10
Warwick Valley Telephone Co	4.5
West Valley Telephone Co	6

Rules For Resuscitation From Electric Shock

Recommended by a Commission Representing The American Medical Association, The National Electric Light Association and The American Institute of Electrical Engineers—Copyright 1912 by the National Electric Light Association—Reprinted by Permission

Treatment for Electrical Shock.

An accidental electric shock usually does not kill at once, but may only stun the victim and for a while stop his breathing.

The shock is not likely to be immediately fatal, because:

a. The conductors may make only a brief and imperfect contact with the body.

b. The skin, unless it is wet, offers high resistance to the current.

Hope of restoring the victim lies in prompt and continued use of artificial respiration. The reasons for this statement are:

a. The body continuously depends on an exchange of air, as shown by the fact that we must breathe in and out about 15 times a minute.

b. If the body is not thus repeatedly supplied with air, suffocation occurs.

c. Persons whose breathing has been stopped by electric shock have been reported restored after artificial respiration has been continued for approximately two hours.

The Schafer, or " prone pressure" method of artificial respiration, slightly modified, is illustrated and described in the following resuscitation rules. The advantages of this method are:

a. Easy performance; little muscular exertion is required.

b. Larger ventilation of the lungs than by the supine method.

c. Simplicity; the operator makes no complex motions and readily learns the method on first trial.

d. No trouble from the tongue falling back into the air passage.

e. No risk of injury to the liver or ribs if the method is executed with proper care.

Aid can be rendered best by one who has studied the rules and has learned them by practise on a volunteer subject.

Instructions for Resuscitation.

FOLLOW THESE INSTRUCTIONS EVEN IF VICTIM APPEARS DEAD.

I.—*Break the circuit immediately.*

1. With a single quick motion separate the victim from the live conductor. In so doing avoid receiving a shock yourself.

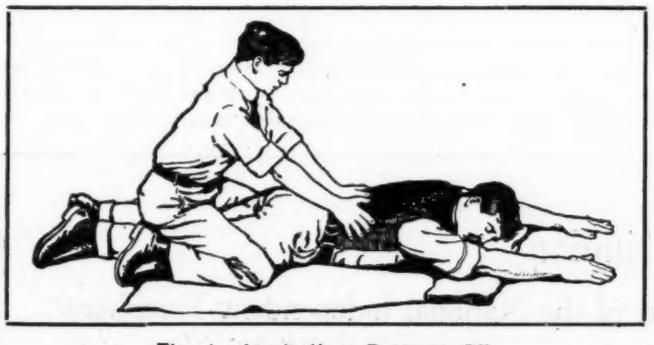


Fig. 1. Inspiration; Pressure Off.

Many have, by their carelessness, received injury in trying to disconnect victims of shock from live conductors.

Observe the Following Precautions.

a. Use a dry coat, a dry rope, a dry stick or board, or any other *dry non-conductor* to move either the victim or the wire, so as to break the electrical contact. Beware of using metal or any moist material. The victim's loose clothing, if dry, may be used to pull him away; do not touch the soles or heels of his shoes while he remains in contact—the nails are dangerous.

b. If the body must be touched by your hands, be sure to cover them with rubber gloves, mackintosh, rubber sheeting or dry cloth; or stand on a dry board or on some other dry insulating surface. If possible, use only *one* hand.

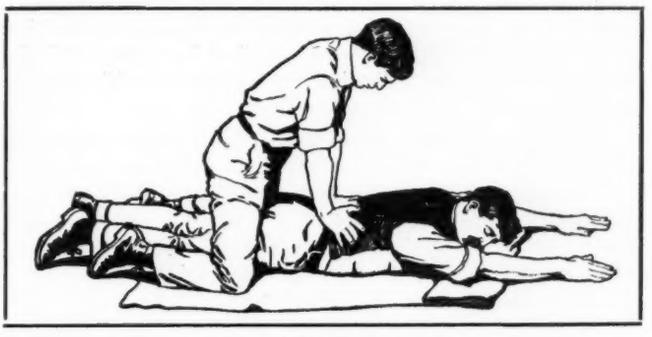


Fig. 2. Expiration; Pressure On.

If the victim is conducting the current to ground, and is convulsively clutching the live conductor, it may be easier to shut off the current by lifting him than by leaving him on the ground and trying to break his grasp.

2. Open the nearest switch, if that is the quickest way to break the circuit.

3. If necessary to cut a live wire, use an axe or a hatchet with a dry wooden handle, or properly insulated pliers.

II.—*Send for the nearest doctor.*

This should be done without a moment's delay, as soon as the accident occurs, and while the victim is being removed from the conductor.

The doctors entered on the following form are recommended:

Name .....
Address .....
Telephone Call .....
Name .....
Address .....
Telephone Call .....

III.—Attend instantly to victim's breathing.

1. As soon as the victim is clear of the live conductor, quickly feel with your finger in his mouth and throat and remove any foreign body (tobacco, false teeth, etc.). *Then begin artificial respiration at once.* Do not stop to loosen the patient's clothing; *every moment of delay is serious.*

2. Lay the subject on his belly, with arms extended as straight forward as possible, and with face to one side, so that the nose and mouth are free for breathing (see Fig. 1). Let an assistant draw forward the subject's tongue.

If possible, avoid so laying the subject that any burned places are pressed upon.

Do not permit bystanders to crowd about and shut off fresh air.

3. Kneel straddling the subject's thighs and facing his head; rest the palms of your hands on the loins (on the muscles of the small of the back), with thumbs nearly touching each other, and with fingers spread over the lowest ribs (see Fig. 1).

4. With arms held straight, swing forward slowly so that the weight of your body is gradually brought to bear upon the subject (see Fig. 2). This operation, which should take from two to three seconds, *must not be violent*—internal organs may be injured. The lower part of the chest and also the abdomen are thus compressed, and air is forced out of the lungs.

5. Now *immediately* swing backward so as to remove the pressure, but leave your hands in place, thus returning to the position shown in Fig. 1. Through their elasticity, the chest walls expand and the lungs are thus supplied with fresh air.

6. After two seconds swing forward again. Thus repeat deliberately twelve to fifteen times a minute the double movement of compression and release—a complete respiration in four or five seconds. If a watch or a clock is not visible, follow the natural rate of your own deep breathing—swinging forward with each respiration, and backward with each inspiration.

While this is being done, an assistant should loosen any tight clothing about the subject's neck, chest, or waist.

7. Continue artificial respiration (if necessary, two hours or longer), *without interruption*, until breathing is restored, or until a physician arrives. Even after natural breathing begins, carefully watch that it continues. If it stops, start artificial respiration again.

During the period of operation, keep the subject warm by applying a proper covering and by laying beside his body bottles or rubber bags filled with *warm* (not hot) water. The attention to keeping the subject warm should be given by an assistant or assistants.

8. *Do not give any liquids whatever by mouth until the subject is fully conscious.*

First Care of Burns.

When natural respiration has been restored, burns, if serious, should be attended to until a doctor comes.

A raw or blistered surface should be protected from the air. If clothing sticks do not peel it off—cut around it. The adherent cloth, or a dressing of cotton or other soft material applied to the burned surface, should be saturated with picric acid (0.5 per cent.). If this is not at hand, use a solution of baking soda (one teaspoonful to a pint of water), or the wound may be coated with a paste of flour and water. Or it may be protected with a heavy oil such as machine oil, transformer oil, vaseline, linseed, carron or olive oil. Cover the dressing with cotton, gauze, lint, clean waste, clean handkerchiefs or other soft cloth, held lightly in place by a bandage.

The same coverings should be lightly bandaged over a dry, charred burn, but without wetting the burned region or applying oil to it.

Do not open blisters.

Program for Wisconsin Convention.

The annual meeting of the Wisconsin State Telephone Association will be called to order in the supervisor's room, in the court house at Madison, Wis., on Wednesday, February 12, when the following program will be carried out:

Registration. Reading of the minutes of the last meeting. Report of existing committees.

Address, by President John A. Pratt, of Menomonee Falls. Falls.

Report of the secretary and treasurer, P. J. Weirich, Monroe, Wis. Report of standing committees. Report of executive committee. Appointment of special committees. Announcements. Adjournment to visit the exhibits at the Park Hotel.

Afternoon Session, Wednesday, 2 p. m.

Address by Hon. John T. Gaveny, president of the Western Wisconsin Telephone Co., Arcadia, Wis.

Address by Manford Savage, president National Independent Telephone Association.

"The Market for Public Service Securities and the Stock and Bond Law in Wisconsin," by A. J. Dreher, manager of the bond department of the Marshall & Ilsey Bank, Milwaukee.

Adjournment to visit exhibits.

Evening Session, Wednesday, 7:30 p. m.

Entertainment at the New Orpheum theatre.

Banquet at the Park Hotel.

Morning Session, Thursday, 9:00 a. m.

Business meeting. Reports of committees. Election of officers.

Address by Mr. F. L. Eldridge, field manager of the Central States Telephone Service Association.

"Success and Failure in the Telephone Business," by Joseph Edwards, Elroy, Wis.

Thursday Afternoon.

Special arrangements have been made to have street cars leave the Park Hotel and the Capitol Hotel at 1:30 sharp, when the members and their guests will be conveyed to the auditorium of the Electrical Engineering Building, where a paper entitled "Telephone Plant Maintenance," will be read by F. J. Mayer, district manager of the Wisconsin Telephone Co., at Madison.

This lecture will be illustrated by stereopticon views. Immediately following the lecture they will go to the testing laboratories of Prof. Bennett, Prof. Jansky and Instructor Woolheiser to demonstrate the action of an induction coil and perform tests of carbon conductors, demonstrating their action under static discharges. They will also give a novel demonstration showing the effect of high tension lines upon telephone circuits. This is made possible by means of a 400,000-volt transformer. Other interesting experiments will also be made and an opportunity given to visit the University laboratories.

An Invitation

The Board of Directors and Officers of the National Independent Telephone Association extend to all Independent Telephone men a most cordial invitation to to attend the coming annual convention to be held at the Hotel LaSalle, Chicago, February 18, 19, 20.

Manford Savage,
President.

The Passing Show

The Law of Progress—Penalties of Privilege

By J. C. Kelsey

We are making progress. It may be but of a temporary kind—because Dr. Wallace, a scientist, says that a close search of 7,000 years of history has never revealed any mental or moral progress.

Other eras have made great gains, only to lose them in the years following.

But you and I are not so greatly concerned in the following ages—whether dark or light. Dark ages have followed, because seemingly healthy and progressing nations have thoughtlessly encouraged privilege. The rot of privilege has not failed to ruin the fabric of every past civilization.

Today, the whole world is struggling to overcome the very tendency which has ruined nations—seemingly conscious of its doom.

We are striving to make men—or rather, opportunity—equal, otherwise our progressive gains will be abortive and ultimately lost in the dark ages to follow.

Two things are to come to pass which will have a leveling influence. First, an income tax. This gets at the very root of inequality, that is, the equality of burden-bearing.

The poor man pays maximum taxes and the more affluent do not. In the last town I lived in, the richest man in the place paid taxes on $300 valuation.

Second, the tariff changes. I like the spirit of the congressional committee. They are proceeding in a business-like way. They are interviewing wool men, leather dealers and every walk of privilege.

The theory of the new tariff will be a duty which will protect. Yet it will not protect so well that no imports will be attempted. Think of the folly of putting such a prohibitive tariff duty upon goods that this country gets no revenue at all!

Surely the rankest tariff advocate should believe in some revenue-producing. It is a queer paradox that the most highly protected interests pay the poorest wages and have the most squalid employes.

It would make you heart-sick to watch a garment-workers' parade, but you would not weep over a parade of their employers, for they would ride in gilded limousines.

The New York Stock Exchange has even started to put its house in order. It has asked the governor of New York for a hearing. The members want to clear their skirts, because the testimony before the Pujo Committee has hurt their business.

Now we know the secret of the entire desire to reform. It is unwelcome publicity.

Publicity is a new weapon in the hands of the world. It has more force than all the guns of the great powers. Publicity informed the American people that, if they dealt with the New York Stock Exchange on the present basis, they had little or no protection. So they quit patronizing it.

Possibly the reason that dark ages followed eras of progress before is because no publicity was possible. No one dared to shout the warnings to the people—besides people then did not have so much courage as they have now.

Possibly the public could not read, being kept in ignorance by the ruling classes, who, in taking undue privilege, sapped the red blood of the people.

I don't think there would be such a feeling about the tariff, if it were not for the newspapers. Fortunately, newspapers themselves are victims of a paper trust, and a prohibitive tariff, and they have been free to cry about it, too.

So it may be that the eminent Dr. Wallace may be wrong. We will go on forever and have no dark age, because the world recognizes the necessity of killing privilege and giving all men a chance.

When you think of it, giving one man an unusual privilege, or even a group of men, is an outrageous proceeding. The whole idea is distasteful as it is injurious.

If men can't make money on raising sugar, let them raise something else. Why pay them a bounty or protect them? If men cannot run a line of ships without subsidy or privilege, let them do something else. Let men do that which is reasonable and give them reasonable safe-guards.

Nothing makes you madder than to stand in line at a big ball game, and then have some privilegee step up from the side and get his tickets!

Privilege is the root of all evil. Privilege has caused nations to die and live only in biased histories.

Privilege has caused the bloodiest wars of history. Some people claimed the privilege of holding human beings as slaves; others the privileges of territory or gold mine or something of a greedy nature.

Today we are fighting privilege of monopoly. Monopoly claims the privilege of tickets without waiting in line. Monopoly is a most natural human tendency. You, yourself, would enjoy a monopoly hugely.

As Independent telephone men we protest the privilege of operating telephone systems, as it existed for many years. At first we were excommunicated, as it were, and looked upon as pariahs. We were bluffed by patent lawyers and slept under lock and key.

We have fought a great up-hill fight. Today the Bell company has been sent before the Interstate Commerce Commission to put its house in order. *I tell you it is a great victory.*

I have heard Mr. Wickersham criticized for not taking action, but, whatever his motives were, he did the very best thing. Those of you who are bothered with low competitive rates can now appeal to the commission for relief. If you can show that monopoly charges certain prices for the same service elsewhere, you can get an order making them charge likewise at your place.

A simple suit of dissolution would have taken years, and it is doubtful if the government could win anyway.

There are thousands of awful examples of federal violations, but when you think that the state boards, or the public, approved of these examples, you can see that the government had no really good case.

The Interstate Commerce Commission stands as a factor

in the law of progress. It is a leveler, a foe of privilege, and an exponent of equal opportunities.

I cannot understand why railway officials are so unanimously abusive of this body. If it has ruled drastically against the railroads, the officials themselves are to blame for the wrong presentation of their case.

I cannot understand why any state Independent telephone association can honestly go on record against state commission control. I suppose it is because most human beings stand in their own light.

When the Bell company stands before the Interstate Commerce Commission, it will have to explain why it charges low rates where competition exists. Can the Bell officials justify it? You know they can't!

Speed the day when the commission takes charge! It means an end to South Bends, Johnstowns and other cities where cut-throat rates do exist.

That is all the equality any reasonable Independent telephone man can ask—the equality of charges. It is simple!

When strict equality exists, I believe every one will make more money. There is no excuse in the world for rate-cutting. It is a fool's game. It only brings in business over the devil's back. You know the rest.

No company can charge $2 for business telephone service to smoke out a competitor, and then charge $6. It has not been done yet!

I hope that no future telephone convention will be silly enough to go on record against commission control. I tell you, it is what we want!

We want our house in order, we want our affairs on public record, and we will have to do it whether we want to or not. It is the handwriting on the wall!

Being on public record is in itself a guaranty against unusual privilege. You, as a telephone man, do not need unusual privilege. All you want is a square deal, or equal opportunity.

I heard a man the other day bemoaning the fact that the tariff on rails would be reduced and hurt business. I asked him if he knew that railways had nearly twenty billions worth of property. And no protection at all.

Why should a billion dollar concern have the privilege of taxing a twenty billion dollar concern? Who is hurt the most?

Does the telephone operating industry get any protection? None at all! All the protection they ask for lies under the 13th amendment—the right not to be confiscated. That is all any concern should ask for.

It always amuses me to hear any man say that everything in his line is going to the bow-wows. I have heard men speak of the good old times in Independent telephony. Of course, there is a great deal of human nature in that remark, but it is dead wrong! The best times of Independent telephony are today and tomorrow. And each man who attends the convention should bear that in mind.

A man not long ago, asked me if it would be advisable to invest more money in extensions to his property. He seemed to have a dread of the Bell company still active in his heart.

I advised him to get busy, because there never was a better opportunity for investment for profit.

Just look at the facts. We have nearly one hundred million people. There are about 9,000,000 telephones—there should be 20,000,000.

The Bell company recently financed two years in advance, $67,000,000 in the form of convertible bonds. This $67,000,000 will be invested in extensions and will participate in the increasing earnings of the company. It will be invested in long distance lines, and possibly 600,000 telephones—in other words, 300,000 telephones per year, or at the rate which would give us 11,000,000 additional telephones in about 36 years.

It is a great undertaking to raise $67,000,000 every two years, and it could all be easily invested in our large cities. This would leave the smaller localities to be financed locally—and if 300,000 telephones could be financed locally, we would be 18 years in catching up to development, instead of 36 years—of course, wrongly assuming that the country will not grow.

Common sense should tell any Bell official and Independent official that one company cannot do all the financing, nor will it want to do so.

Twenty million telephones represent nearly a $3,000,000,000 investment. Don't you see that it would take a long while to raise that money, when railroads and other properties need so much money, too?

The queer part about the 11,000,000 telephones that are to be put in service in the coming years is that they will really not have to be solicited.

A business whose customers seek it is certainly a good one. And that is what happens in telephone circles. I'll bet you can't name a company which has no waiting list.

The opportunities are present and are also ahead in the telephone business. The past 15 years are but a foundation-stone of experience.

Almost every Independent telephone company would be put on Easy street by the addition of 25 cents per month in rates. If the companies could get an additional $6 per year for each telephone, we would be deluged with money. And think of what an additional 50 cents per month would mean to the Bell interests. It would give them $27,000,000 more per year.

Liston to the complaints of railroads. And compare telephone requirements. They are simple in comparison! Don't be amazed at $67,000,000. That is a relatively small amount. And we should be glad that the Bell interests can finance themselves, however slow and snail-like they are in doing it.

You can get more money to put into your business too, if you try.

The good old times in Independent telephony are all fiction. The good times ahead alone are facts!

I hope that convention delegates will not take themselves too seriously, nor be gloomy. I would like to see the convention take a bright view of existence and smile somewhat.

Do something to emphasize the strategic position of Independent telephony; to show to investors that a local company can make money where a general company cannot.

I don't believe the Bell interests want to be littered with the small towns. I believe they will have to hustle to keep up to the requirements of cities over 50,000.

I believe the Bell interests will quickly learn to banish red ink from their books, and turn the territory over to companies who can use nothing but black ink.

There are millions of dollars to be saved by a sensible construction program. No one need lose a single dollar.

Of course, there are countless places where Independents still have grievances, and no one expects those to have any belief in constructiveness. It takes time to heal wounds.

Yet the fact remains that the telephone business needs to conserve every dollar. There is no excuse for wastes like Johnstown, and there is no valid excuse for many Independent franchises recently granted. The money could be expended elsewhere for the benefit of happy stockholders.

The most pitiable thing is a stock certificate which pays no dividends. And the nicest thing is stock which does pay. Let us take the latter position. It is very, very possible.

In the telephone business we ask only equality—we have that since the Interstate Commerce Commission has taken over the telephone. Progress is accordingly possible and permanent—we have started to eliminate privilege.

Let the convention bring out the localness of the telephone. And may each man resolve to go home and absorb his waiting list without fear or favor. If the convention can make its members realize their mighty power, the three days are well spent.

Honestly, I believe Independent telephony struck the first real blow to privilege!

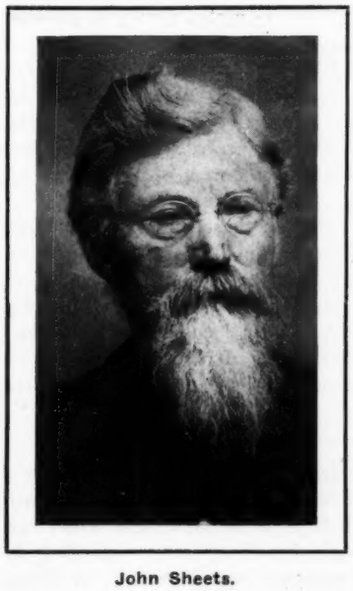
MORAL: Don't stand in your own light.

Bell to Increase Stock.

At the annual meeting of stockholders of the Cincinnati & Suburban Bell Telephone Co., the proposed increase in capital stock from $8,000,000 to $12,000,000 will come up for ratification. Under the directors' plan, stockholders of record March 15 are offered the right to subscribe pro rata in the proportion of one-twelfth of their holdings for $588,150 new stock at par, this being $50 per share, payable April 2. Proceeds of the stock will be held for contingencies as they arise.

A "Live Wire" in the West.

A real factor in the Independent telephone business in the West is John Sheets, manager of the Tillamook Mutual Telephone Co., of Tillamook, Oregon. Mr. Sheets, who is a civil war veteran and over 68 years of age, came to the coast shortly after the close of the war, by the overland route. After several years of moving about he finally took up a homestead in Tillamook county, and has been one of the county's enthusiastic boosters ever since, having the honor of being the first mayor of Tillamook.



John Sheets.

He became interested in the telephone field some years ago, when the Bell service became so poor that a local company was organized to better conditions. He has been manager of the system for several years past and has complete charge of the maintenance and operation of the plant. Through Mr. Sheets' efforts the company now has upwards of 400 subscribers, which is a good deal more than the Bell can claim. The people have perfect confidence in his ability and although several efforts have been made by the Bell to buy the company, all offers have been rejected.

He Believes in Hard Work.

Mr. Sheets has an automobile in which he travels over the rural and mountainous districts, and is a firm believer in work. When one sees him don climbers and "safety" and climb a pole like a school boy, it is hard to believe that he is as old as the facts record him.

The Rural Telephone and Parcel Post.

Postmaster-General Hitchcock, says the Telephone News, has the following to say regarding rural telephones in connection with the parcel post:

"Rural telephones have spread over practically the entire country, and they will be used in conjunction with the parcel post to the advantage of both the farmer and the country merchant. The housewife, for example, finds that she is out of sugar; she steps to her telephone and orders it sent by parcel post. If the farmer breaks a harrow or a part of some farm equipment, it will not be necessary for him to hitch up and drive to town; he will merely step to his telephone and order the new part sent by parcel post. The time saved will more than compensate him for his outlay of stamps. I expect to see the country merchants advertising free delivery in their local papers, just as their city brothers do. They will use the parcel post as their delivery wagons."

Bell Threatens to Withdraw from Streator, Ill.

The Central Union Telephone Co. has threatened to withdraw its service from Streator, Ill., if the city council persists in its demand for a 2 per cent. share of the annual receipts of the company on business originating in this city. This ultimatum has been formally served on the city council by Thos. Brown, commercial superintendent of the company.

Operators' School at Bloomington, Ill.

At a meeting some time ago of the McLean County, Ill., Telephone Association, which includes all the telephone companies in McLean and adjoining counties, it was decided to hold an operators' school at Bloomington, in order to instruct long-distance operators how to handle all service in regard to passing tickets, receiving and routing them. Mr. Vivian, secretary-treasurer of the Michigan association, was chosen as instructor. He arrived upon the scene with three switchboards representing three different exchanges in different cities.

An operator was chosen from the class for each one of these exchanges, there being 47 present the first day and 35 the second. The manager from some exchange was called upon to pass a ticket, representing a subscriber in the most ignorant way possible. He would explain to Central to whom he wished to speak, leaving out all the possible information, thus giving the operator a chance to ask a great many questions before she could pass the ticket. In different cases she would neglect to find out some of the important points and the other operators thus had a chance to criticize.

Not only did the operators receive great benefit from this school but it gave them a chance to become personally acquainted with operators with whom they talked every day. They also learned much from the lecture given by Mr. Vivian, who instructed them in a great many things that are necessary for proficient operating. The school lasted about four hours each day and the girls returned to their homes with many useful ideas obtained from the other operators and the instructor. The Kinloch-Bloomington Telephone Co. with its manager, Mr. Ainsworth, entertained all the operators and the managers at lunch and each departed for home at the end of the second day with the feeling that the Kinloch people were great entertainers.

Operators' School of the McLean County Telephone Association

The operators who attended the school were: Edna Hernon, Armington; Miss Robinson, Aurora; Mattie McCullough and Grace Longworth, Atlanta; Katherine Raydon, Edith Berry, Mae Williams, Isabelle MacDonald, Edith Page, Minnie Goodner, Kitty N. Gang and T. Anne Barnes, all of Bloomington; Mrs. F. Guynne, Chicago; Nell Mahoney, Harriett Richardson, Mabel Meadors and Maude Hamilton, Clinton; Viola Ernest, Vera Benipel, Clinton; Maggie Croos, DeWitt; Emma Geiger, Kate Roach, Rose Geiger, Tresa Fitzgerald and Mollie Leddy, El Paso; Bertha Eppstein and Rose Rusterholz, Fairbury; Winifred Gilbert, Elva Smith, Mary Kirby, Kathryn Condon, Grace Lindeman and Hazel Farmer, Farmer City; Mae Coone, Anna Caldwell and Alma Lucas, Heyworth; Gertie Melcher, Joliet; Ethel M. Edwards, Kenny; Ivy Nealby, Birdie Middleton, Lydia Beckham, Emily Kimler, Florence Van Atta and Hazel Parlss, Le Roy; Leona B. Rowan, Rachael A. Armstrong, Irma Hankey and Harriett Allison, Lexington; Virgie Dishong, N. Fay Hopper, Burke Gardner and Louise Yanery, McLean; Flossie Smith, Mackinaw; Maude McGrath and Wavia Bouer, Mansfield; Margaret Hainline, Minier; Madge Newcomb, Saybrook; Belle Gant, Stanford; Martha Ruch and Rose Dixon, Peoria, and Fern Costley, Weldon.

Special Lectures Under A. I. E E. Auspices.

At the regular January meeting of the board of directors of the American Institute of Electrical Engineers, in New York City, among other things, it was announced that arrangements had been made for a series of four lectures by Professor E. P. Adams, of the Palmer Physical Laboratory, Princeton University, on Tuesday evening of each of the last two weeks in March and the first two weeks in April, under the auspices of the electrophysics committee.

These lectures will offer an unusual opportunity for engineers to obtain an insight into the nature of the phenomena which have been discovered in this most fascinating field of research. The discovery of radio-active substances and the study of their properties constitute probably the most important support of modern accepted theories of the nature of electricity and matter.

Professor Adams has consented in these lectures to present a general survey of the history and important results of radio-active research and the bearing of these results on modern electrical theory. They will aim to respond directly to the increasing demand from electrical engineers for a simple and comprehensive description of the phenomena of radioactivity. They will assume that the hearer has no present knowledge of the subject.

Edison Medal Awarded to William Stanley.

By the unanimous vote of all the members of the Edison medal committee, the fourth Edison medal of the American Institute of Electrical Engineers has been awarded to William Stanley, electrical engineer and inventor, of Great Barrington, Mass., for "meritorious achievement in invention and development of alternating current systems and apparatus."

British Government Takes Over Its Big Competitor

Account of Final Details of Negotiations Which Resulted in Purchase by British Post Office of System of National Telephone Co. in England, Scotland and Ireland—Value Fixed at £12,515,264, or About Sixty-Two Millions of Dollars

The long arbitration between the National Telephone Company, Ltd., and the British Post Office to determine the price which the latter should pay for the company's undertaking, was, as has already been briefly reported by TELEPHONY, brought to a close recently, when the value was judged to be £12,515,264. The original claim made by the company was slightly in excess of £20,000,000, and the offer made by the Post Office, approximately, £11,000,000.

The arbitration was carried out before the court of the Railway and Canal Commission, consisting of Justice A. T. Lawrence, the Hon. A. E. Gathorne-Hardy and Sir James Woodhouse. They had to determine in accordance with a purchase agreement dated August 8, 1905, the value of the property of the National Telephone Co. upon its transfer to the postmaster general at the expiration of the company's license, which expired on December 31, 1911.

The area embraced included England, Scotland and Ireland. At the time of transfer there were 561,356 stations in existence, 1,509 exchanges, and about 730,000 miles of circuit, including 414,000 miles underground, 260,000 miles of bare wire overhead, and 56,000 miles of aerial cable.

By the deed of transfer, the price to be paid was to be the "then value (exclusive of any allowance for past or future profits of the undertaking, or any compensation for compulsory sale or other consideration whatsoever, of such plant, land, buildings, stores and furniture, having regard to its suitability for the purpose of the postmaster general's telephonic service." This is practically what is known as "tramway terms," or the usual method of acquisition of a tramway undertaking by a local authority, with the exception that the clause is somewhat differently worded. This enabled counsel for the company to adduce arguments in favor of increasing the price over that which would be paid under bare tramway terms.

In order to present the case to the court, an inventory was taken of all the equipment to be taken over. For this purpose a large staff was employed for a considerable time. The particulars of the applicants' claims presented to the court was divided into 12 headings. Heading 1 comprised most of the underground and overhead plant, exchange equipment and subscribers' apparatus, taken in accordance with the provisions of an agreement come to in October, 1910; headings 2, 3 and 4 comprised similar plant, which was inventoried under later agreements; heading 5 comprised plant constructed after taking inventory; heading 6, plant inventoried and varied by agreement; headings 7 and 8 comprised certain books, stationery, land and buildings, etc; heading 9 comprised the licensed telephonic business of the company at Portsmouth, Brighton and Hull, where, owing to the local municipal authorities having a telephone license, the company was operating under different conditions to those which appertained to the rest of the system. In these cases a special allowance for the business element was claimed. Headings 10, 11 and 12 comprised the private wire business of the company, certain stores, tools and office furniture.

The method of presenting the matter to the court was to divide the plant into classes such as underground and overhead, to sub-divide each class, and then to value the unit of each sub-division. The value of the unit was then multiplied by the number of such units in the inventory.

In the first place, the price of the material was ascertained; then the cost of its transportation to the site where it was to be used, to which the labor cost for erection up to and including the "gang foreman" was determined. This was called "plant cost." To this was added, by means of percentages, the cost of all additional items of expense to which it was alleged a constructor of the system would be put in the matter.

The company based its case upon its own experience. For materials, it took the average price paid for a period of 12 years, and for labor, the average cost for six years. The country was mapped out into six areas and two years allowed for the construction in each, one being done at a time. The Post Office reckoned that the six areas could be worked concurrently. The Post Office experience being much more restricted in large matters of construction than that of the company, it deduced its prices from a consideration of what it thought a contractor would be prepared to do the work for, having regard to its experience in smaller matters in the past.

The government's witness was J. F. C. Snell, of the firm of Messrs. Preece, Cardew and Snell, consulting engineers, who, working on information supplied by the Post Office, and his own experience as a contractor for large electric light and power undertakings, added the following percentages to the labor cost: Engineering assistants and clerical staff, 13; rent, rates, taxes, gas, water and fuel, 5; furniture ½; traveling and other expenses of gang hands, 10; use of tools. 3½; incidental payment on temporary stores, 1; casualty insurance, 1½; stationery, stamps, etc., 4; making a total of 38½, which they had increased to 40 in their estimate. To the total amount was added 5 per cent. to cover the employers' interest in the work, plus 10 per cent. for contractors' profit.

The company's allowance for office charges, etc., came out considerably greater than those allowed by the Post Office. In the judgment, Justice Lawrence said that he could not agree with the methods of calculation employed by either the company or the Post Office. The company deduced its percentages for supervision on the cost of labor and materials, and the Post Office on labor alone. It seemed to him that the evidence given by two or three witnesses that they preferred to take the ratio to labor and material, was far sounder.

After the case had been in progress for 35 days, an agreement was come to on the "fundamental cost" of the plant, i. e., the cost of erection, including material, labor, freight and casualty insurance, but excluding the cost of ordering and storing material, wayleaves (rights of way), local engineering supervision, district supervision, head office engineering and administration, contractor's profits, cost of raising capital, interest during construction, contingencies, etc. The agreed figure (less depreciation) was £10,313,765. It was held that the cost of supervision, etc., was not influenced, whether the work was done in two or 12 years.

He disagreed with the figures put forward by the company, because they were deduced from investigations carried out towards the end of the company's life, when maintenance work was increased and construction decreased, so that, since the staff was not materially reduced, their percentages came out too high. On the other hand, the Post Office figures produced were for an isolated district in Wales, and certainly were not a fair guide. The figures themselves, it was held, ought to have been produced. When the cost of construction was determined it was depreciated according to the time the various items had been in use, and their estimated life.

The company put forward the sinking fund method, in which the life of the plant is taken, and a sum is then ascertained, which, when paid into a sinking fund at compound

interest, would replace the cost at the end of the life. It was suggested that, if the amount in the sinking fund in any year of the life be deducted from the cost of the plant, the remainder would give the value of the plant at that moment.

The method put forward by the Post Office was the well known straight-line method, in which the value is reduced in the ratio which the age bears to the life of the plant. This was the method which the Court adopted. It had, said Justice Lawrence, the merit of affecting both buyer and seller equally if any error was introduced. In determining the life of the plant, the company took what was called the physicial life, while the Post Office took the effective life, which was considerably shorter than the physical life. In this they took account of various factors, including obsolescence, probable growth of business, defective plant, etc., but they allowed a greater scrap value than the company did, so that whether the life and scrap value put forward by the company, or the life and scrap value put forward by the Post Office were taken, the result was not materially different. In delivering judgment Justice Lawrence said:

"It is the relation of age to life which justifies the application of the straight-line method of depreciating the cost of the article. To apply to this calculation other considerations than that of the time during which the plant would continue properly to perform its service seems to me not to be permissible; it involves a confusion of thought. The possible and even probable growth of the postmaster general's telephonic business has no bearing upon the present value of a piece of the company's plant. It is a consideration which runs right athwart the established mode of estimating value, namely, by considering what it would cost the postmaster general to erect that very piece of plant, less depreciation for the user by the company.

The measure of the probable expansion of the postmaster general's business is also unsatisfactory. It is assumed that it would expand to the same extent and at the same rate as the company's business had expanded in the past. This assumption is not supported by any evidence other than that of hope and expectation.

The second ground, namely, that of the probability of improved types of plant being substituted, is open to the same kind of objections as I have mentioned above; it is equally uncertain and equally unsuited to the purpose to which it is applied.

The third ground, that of defects of particular plant, violates the assumption upon which the calculation commences. It is quite plain, and is admitted, that an allowance for all proved defects must be made, but it does not come properly into this question of life unless the defective plant is first put into a class of its own. Thus some cement blocks were proved to be defective and an allowance will have to be made for these; but that does not seem to me a good reason for adopting as the basis of the whole calculation, not the physical life of this plant, but the so-called 'proper' or 'effective' life.

I have depreciated the value upon the straight-line method, by reference to the physical life so reduced. The result at which I arrive is this. I find that the construction value of the plant under headings 1, 2, 3 and 4 of the particulars of claim, is £13,457,016, and that the depreciated value of this plant is £10,459,796."

The original claim for £20,264,851 was depreciated to £17,631,606, but, during the progress of the case, the bulk of this claim before depreciation was amended from £19,550,315 to £18,133,193, and the Post Office offered £12,143,865 instead of £11,617,159. This amount included the sum of £247,189 to cover the cost of raising capital, the company's original claim for which was £757,657.

The three arbitrators were not unanimous with regard to this one item. Justice Lawrence and the Hon. A. E. Gathorne-Hardy held that, as they had to determine the cost of construction, the cost of raising capital was a necessary item in the cost of construction, and it had, therefore, to be considered. Assuming a plant cost of £10,000,000 to construct, out of which £300,000 had been properly spent in raising the capital required to pay for this construction, if the contractor were to receive the cost, less the £300,000, he would be the loser of that amount.

On the other hand, Sir James Woodhouse held that both vendor and purchaser were put to the cost of raising capital, and it could not be regarded as an item in the cost of construction.

During the case, an agreement was come to between the parties respecting all the items under headings 5 to 12, the amount agreed upon being £2,055,468; the original claim was for £3,293,094.

The following table shows in condensed form the amounts accepted by the company, compared with their original claims.

Heading of Claim.	Company's Original Claim.	Accepted in Settlement.
5.—Plant constructed after taking the inventory	£ 658,599	£ 439,390
6.—Plant inventoried and valued by agreement	7,592	7,592
7, 8, 9, 10.—Books, stationery, etc., land and buildings, licensed telephone business at Portsmouth, Brighton and Hull, private wire business	2,104,616	1,231,460
11.—Certain stores and tools	434,747	290,000
12.—Certain furniture, fittings, etc.	87,540	87,026
	£3,293,094	£2,055,468

The time occupied by the proceedings was 71 days, about 32½ being occupied by the company and 38½ by the Post Office.

It was rumored that probably there would be an appeal on at least one point in the award, the allowance for the cost of raising capital. However, there is reason to believe that no appeal of any kind will take place. The Post Office considers that it is paying a fair price for the plant, but the engineers most in contact with the case would not have been surprised had the award reached the figure of £14,000,000.

Operators' School at Saginaw, Michigan.

The Valley Home Telephone Co., of Saginaw, Mich., held its semi-annual convention of long-distance and toll operators, recently, which was attended by about 50 operators from various towns and toll stations operated by the Valley company..

A. T. Babbitt, local manager, opened the meeting with a few introductory remarks and words of welcome. The main address was made by W. S. Vivian, secretary of the Michigan Independent Telephone & Traffic Association, of Grand Rapids, who spoke chiefly of the proposed changes in the official code.

R. H. Cook, wire chief, gave a talk on maintenance and testing of toll lines. J. W. Hitchcock, auditor of the company, discussed collection and error reports.

After the meeting the operators were given a banquet at the Vincent Hotel and then attended a theater party. They were of the unanimous opinion that they had a mighty good time, besides learning many new things about long distance operating.

Spokane Home Doubles Station.

The Home Telephone Co., of Spokane, Wash., increased the number of subscribers 100 per cent. during 1912, having grown from 3,200 to 6,400 telephones, according to an official report for the year made by Thaddeus S. Lane, president of the company. These installations represent an expenditure of approximately $150,000.

New Exchange at Atlanta.

The Atlanta (Ga.) Telephone & Telegraph Co. is about to establish a new exchange at Inman Yards. The equipment has been ordered and a model exchange will soon be in service.

Practical Telephony for the Practical Exchange Manager

A Series of Articles Relating to the Construction, Maintenance and Operation of a Moderate Size Telephone Exchange, Which Began in the Issue of September 21, Expressed in Everyday Terms, Easily Understood—Principles Easily Applied

By H. R. Van Deventer

Arresters of the heavy current type, *b*, or for protecting against foreign currents as well as lightning, are more properly termed "protectors," and in them fuses, or their equivalent, are very properly employed. Usually such devices are installed with a carbon arrester, or choke coil device next to the line, and the fuses between this device and the instruments or cable. Sometimes the position of arrester is reversed.

When the arrester is first, if a heavy current cross occurs, the fuses open the line to the instrument, and the heavy current usually goes to ground via the arrester and often burns it up. If the fuses are first, they open the line to the cable and arrester, and as there is no ground on the line to take care of the cross, the lines are dangerously alive up to the fuse terminals. The arrangement which should be used depends upon the circumstances. The arrester-to-line method is used considerably, as the arrester protects the fuses from lightning discharges, which might blow the fuses in getting to the arrester.

The ability of cable or telephone apparatus to withstand foreign currents is limited. Hence, usually fuses from 1/2 to 3 amperes capacity are employed. To protect against small currents not heavy enough to blow the fuse, but sufficient to heat up a coil winding, the so-called "heat coil" is employed. In most magneto exchanges equipped with modern drops, the drop is so sensitive that it will fall with any current passing through it which is sufficient to heat the winding. Therefore, the fuse protection without heat coils is sufficient.

Where high tension transmission lines are in the territory, special precautions must be taken which will be discussed later.

For small exchanges where lightning protection only is necessary, the following has been found to give good results with a minimum of attention.

Carbon or choke coil arrester for each telephone located where the line enters the building, or a choke coil arrester of a weatherproof type placed on the pole where the cut-in is made. A loop, 30 or 40 feet long, from pole to house will not constitute an exposure if of twin, the arrester on pole being sufficient.

Arresters placed in can top terminals where the open wire leads enter cable.

Office arresters located on the distributing frame.

In exchanges where the lines are subject to crosses with wires carrying heavy currents, fuse protection should be used in connection with the arresters. Fuses at the instruments inside buildings should be of some enclosed type approved by the Fire Underwriters. Fuses on poles are often of the mica strip type. The form with tinned terminals will give good service where properly handled. Such fuses should be tested before the man leaves the pole, as it is hard to tell by looking at them, whether or not they are open.

The office frame often uses the same fuse as the terminals, and in new installations this feature should be specified. Where tubular fuses are used they should be of some form that can be renewed without sending them back to the manufacturers. This is important in the case of small isolated exchanges.

Troublemen should be cautioned not to use heavier fuses than those initially decided upon, as a heavy fuse defeats the very purpose for which it is intended. The reason why many enclosed fuses are made with socket terminals is not so much to facilitate replacement as to eliminate any screw or nut on the terminal under which a wire may be clamped to take the place of a fuse. A notice should be posted prescribing a fine of at least $5 for any copper wire used as a fuse. Serious damage to cables and apparatus has resulted from this practice; the result of laziness on the part of employes, who, finding themselves far from the exchange and out of fuses, will use wire, thinking to replace it "some time," which never comes.

Troublemen Should be Cautioned Against Using Heavier Fuses.

A matter of great importance in laying out a new system, or in rebuilding, is to avoid interference from high tension leads. While the commonly accepted meaning of the term "high tension" is a power transmission line operated at several thousand volts pressure, it will be considered here to also embrace the ordinary series arc street lighting system.

Physical protection in the case of all kinds of high tension lines, should consist in keeping the telephone lines or cables as far away from the power wires as possible, usually on the opposite side of the street. Never run on same pole with power wires if it can be avoided. Where it is necessary to cross the power wires, guard wires should be provided whereby the high tension wires, if broken, are prevented from falling down on the telephone lines.

Protection for the Telephone User.

Suitable protectors must be employed at the central office and at the telephone substations. It is obvious that a cross between the telephone and high tension lines would be a source of danger to anyone using telephone, in the event the protector fuse did not operate. In fact whenever the telephone line is on the same poles with the high tension wires, means for protecting the telephone user should be installed.

The standard form of protection consists of a special insulating transformer whereby the telephone is only inductively

connected to the line, being actually physically insulated therefrom. Such transformers are usually mounted in connection with a static arrester and a pair of high potential fuses. These transformers are very efficient, but are quite expensive and rather cumbersome. They must be carefully protected against lightning and must be properly connected and mounted.

A fairly successful scheme that has given very good service,

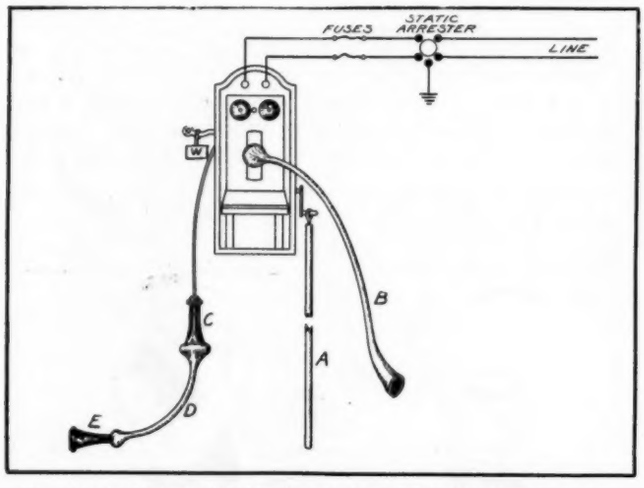


Fig. 30. Telephone Protection against High Tension Dangers.

is to mount the telephone set on the wall out of a person's reach, as shown in Fig. 30. A wooden rod, *A*, is connected to the generator crank for operating it. A rubber tube, *B*, connects to the transmitter and the receiver *C*, is connected to another tube *D*, provided with an ear piece *E*, made from an old receiver shell. The cord on the receiver is long enough to permit the tube *D* being only 12 to 14 inches long. A weight *W* may be used to operate the hook switch.

By this arrangement it is not necessary to touch any part of the telephone, and very good results will be obtained, except the listening is rather poor unless the tube *D* is rather short. Do not trust to the receiver insulation for protection. Often there is sufficient voltage, in case of a cross, to jump from the diaphragm to the user's car and through his body to ground. The entire telephone must be considered as a risk, and as if in direct metallic contact with the line. Such insulation as is used in the instrument is of no service whatever in case of a high tension cross.

To date there are few telephone sets specially constructed for this kind of service. The demand is not great, being confined mostly to power companies and electric railroads, and the problem is a difficult one. The special transformer previously mentioned is about the only special equipment on the market. One manufacturer supplies a special set having an insulated switch hook and rubber generator crank and handle so that the user touches no metal parts.

(To be continued.)

Speed Tests by New York Commission.

The telephone inspectors of the New York Public Service Commission have been busy during the past year making tests of the speed of telephone operators in all parts of the state. Some figures and averages taken from the commission's report, which has just been submitted to the legislature, are given below, showing the comparison with the previous year.

New York City does not get the fastest service, but the Greater City exchanges show an even average that is highly commendable for what is admittedly the largest telephone system in the world. In individual cases, in small cities, where there is but a single central office, a faster service is sometimes rendered, but New York has a dependable service, with a high average speed and a marked improvement over the record for 1911.

The results of the commission's inspections are served upon the telephone corporation with recommendations, wherever found necessary, and it is thought that this system, and the publicity attending, form a valuable check and a great incentive toward maintaining a high grade of service.

Of the various speed tests, the following gives only the interval in seconds between the signal to the operator and the first answer.

RESULTS OF TESTS.

	1911.	1912.
Total number of service tests made	7,531	17,740
Batavia Home Tel. Co., Batavia	3.7	4.0
Dunkirk Home Tel. Co., Dunkirk	4.0	3.8
Federal Tel. & Tel. Co., Buffalo	..	4.6
Federal Tel. & Tel. Co., Corning	4.4	4.0
Federal Tel. & Tel. Co., Ithaca	..	4.4
New York Tel. Co., Albany	5.5	6.4
New York Tel. Co., Batavia	2.6	2.8
New York Tel. Co., Binghamton	..	4.3
New York Tel. Co., Buffalo	4.1	3.3
New York Tel. Co., Corning	2.8	3.6
New York Tel. Co., Cortland	..	4.3
New York Tel. Co., Dunkirk	4.5	4.4
New York Tel. Co., Elmira	4.0	4.0
New York Tel. Co., Ithaca	4.0	4.6
New York Tel. Co., Jamestown	3.6	4.2
New York Tel. Co., New York	6.6	5.4
New York Tel. Co., Niagara Falls	..	6.9
New York Tel. Co., Olean	3.4	3.9
New York Tel. Co., Rochester	3.4	3.6
New York Tel. Co., Syracuse	..	6.1
New York Tel. Co., Watertown	3.7	4.7
Niagara County Home Tel. Co.. Niagara Falls	..	3.6
Rochester Tel. Co., Rochester	..	4.8
York State Tel. Co., Binghamton	3.7	3.7
York State Tel. Co., Elmira	3.4	3.2

North Carolina Co. Pays Regular Dividend.

The Iredell Telephone Co., of Statesville, N. C., is mailing its stockholders checks for the regular 4 per cent. semi-annual dividend. In his letter, W. M. Barringer, secretary, treasurer and manager of the company, says, in part:

"You are doubtless aware of the fact that we have had an unusually hard year on account of having a great deal of expense in moving poles and changing cables and wires to meet the requirements of the city in the street work. This has been quite a large expense—approximately $3,000—which we have paid as we did the work, charging the amount to expense and not construction.

The system has been very greatly improved by the work, and we would have been justified in charging at least a part of the amount to permanent improvement. As stated above, however, we have not done this, but have charged this to expense and have a nice net surplus for the year besides.

We want to urge you to attend the stockholders' meeting, as we are exceedingly anxious for you to know just what we have done and are now doing. When you hear the full report, we are sure you will be proud of this home organization that has been able to overcome the strongest kind of competition, make dividends on the stock and save the town thousands of dollars each year in telephone rentals.

The Iredell Telephone Co. is not owned by a few people trying to make dividends, but is owned by the citizens of Statesville and operated for the good of the whole town. As to the character of the service rendered, we say without fear of successful contradiction that there is no better telephone system in the state. In fact, we doubt very much if there is another as good."

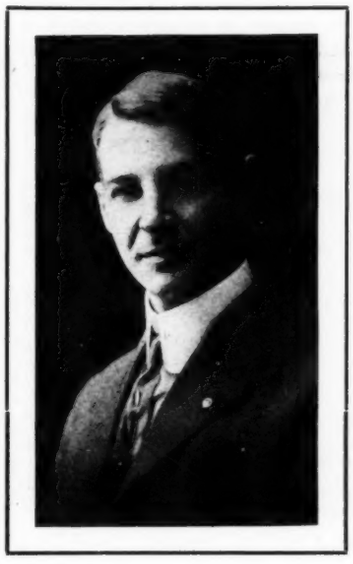
The company operates in States, Taylorsville, Stony Point and Scotts. As stated, W. M. Barringer is secretary, treasurer and general manager. The officers are: President, H. P. Grier; vice-president, E. Morrison.

Authorizes Ignoring of Rate Raise.

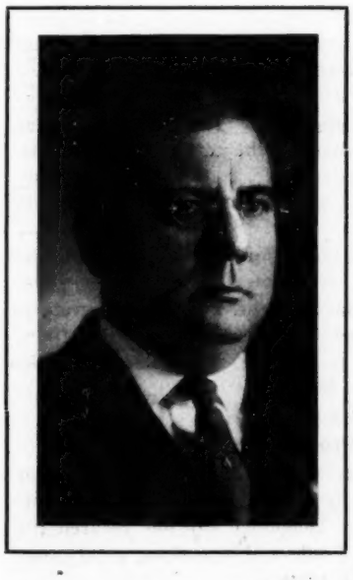
The Merrill, Wis., board of public works has decided to advise that telephone patrons may refuse to pay for telephone service at any higher rate than the old rate untii the state Railroad Commission shall determine whether any any change should be made from the old rates.

A Quartet of Men Prominent in the Telephone Field

M. S. VAN VLEET, assistant sales manager for the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., employed his vacation during his grammar and high school days in learning salesmanship in grocery, hardware and tinsmith stores. Vacation periods while he was studying at Cornell University were put in, in 1901, as machinist's helper in the Illinois Central Railroad's shops; in 1902, as special apprentice for the Stanley Electric Co., at Pittsfield, Mass. In 1904 he went with the Stromberg-Carlson Telephone Mfg. Co., in the electrical laboratory. Subsequently he was moved to the engineering department, from which he went to the head of the exchange equipment division of the company. Later he was made assistant sales engineer. During 1912 he was manager of the Kansas City branch office, which was closed the latter part of the year, at which time Mr. Van Vleet was made field manager for the company. He became assistant sales manager February 1, 1913. He is a Mason, a Knight Templar and a Shriner. He is also a member of the Cornell Club and the Rochester Yacht Club. He was born in Ovid, N. Y., July 24, 1881.



HENRY Le FAIVRE DILLON, manager of the Shreveport Home Telephone Co., Shreveport, La., and president of the Pleasant Hill Telephone Co., Pleasant Hill, La., is a native of Iowa, having been born in Keokuk January 13, 1870. He was educated at St. Mary's College, St. Mary's, Kans., and is a Mason, both Scottish and York Rites. He is also a member of the Rejuvenated Sons of Jove and the United Commercial Travellers of America. Mr. Dillon held a financial interest in the companies above named, for several years, and assumed their management on December 1, 1910. From 1886 to 1895 he was connected with the Standard Oil Co., at Sioux City, Iowa. From March, 1896, to September 1, 1905, he was with the commercial agency of R. G. Dun & Co., at Toledo, Ohio. He was manager for the Bradstreet Co., at Omaha, Neb., from May 1, 1907, to May 1, 1910. Believing that the South offered a profitable field for telephone development, Mr. Dillon engaged in the business there, and now gives most of his time to the management of his two companies and their further development.



EDWARD STOEFFHAAS, president and general manager of the Rebuilt Telephone Equipment Co., Chicago, was born in that city July 18, 1885. As a boy of 13 he entered the employ of the Western Telephone Construction Co., running errands. There, in his leisure time, he became interested in telephones and started a course of self instruction with such books as he could obtain. Later he gained practical experience in the various departments of that and other companies, including the Kellogg Switchboard & Supply Co. and the Stromberg-Carlson Telephone Mfg. Co. From 1902 to 1909 he was superintendent of the rebuilt telephone and switchboard departments of several concerns. For more than a year he was in charge of power board work for the Commonwealth Edison Co., during the construction of the Roseland sub-station, at Chicago. For a time he was manager of the Hebron Telephone Co., in which he owned a half interest. In May, 1911, he sold this stock and organized the Rebuilt Telephone Equipment Co., with which he has since been connected. Mr. Stoeffhaas is a Mason.

CHARLES M. McGREGOR, secretary, treasurer and general manager of the Posey County Home Telephone Co., with headquarters at Mt. Vernon, Ind., was born in West Virginia, June 2, 1877. He is a graduate of the grade and high schools of Mt. Vernon, Wabash College and Purdue University. He is a member of the Phi Delta Theta Fraternity, the B. P. O. Elks and the Modern Woodmen of America. He is also a Mason. After leaving school Mr. McGregor associated himself with the Bell telephone companies operating at Toledo, Ohio, and Vincennes, Indiana, acting as wire chief and engineer. In 1902 he organized the Posey County Home Telephone Co., with which he has since been associated. Aside from his telephone interests, Mr. McGregor is agent for the B. McGregor estate, comprising a large amount of land, some 2,000 acres. In this capacity he has the superintendence of farms and timber sales throughout the tract. While the management of this property occupies a considerable portion of his time, Mr. McGregor keeps in close touch with the telephone plant of which he is manager.

An Impressive Toll Line Showing in Texas.

On the opposite page there is a reproduction of a map of the toll lines and exchanges of the Brazos Valley Telephone & Telegraph Co., of Waco, Texas, and its connecting lines. This shows at a glance what a tremendous field the company already covers, a field which is being extended every day.

The small strip at the bottom of the page is the extension of the line to the East, the limitations of space requiring this to be detached from the map and set below. The double broken line shows phantom circuits, other lines indicating Nos. 8, 10 and 12 copper, Nos. 10, 12 and 14 iron and grounded lines. The solid dot shows a toll station, the circle, a class E exchange and the rectangle, a local exchange.

The Brazos Valley Telegraph & Telephone Co. operates exchanges in Abbott, Clifton, West, Lorena, Walnut Springs, McGregor, Meridian, Oglesby, Moody, Mart and Waco. Its toll lines extend from Hico to Waco via Walnut Springs, Morgan and Whitney; from Morgan to Temple via Clifton, Meridian, Valley Mills, Crawford and Moody; from Temple to Waco via Troy, Eddy, Bruceville and Lorena; from Waco to Mart; from Waco half the distance to Marlin; from Waco north to Dallas (as soon as the new lines are completed) via West, Abbott, Hillsboro, Waxahachie, Sterrett, Red Oak and Lancaster, excepting that the line from Hillsboro to Waxahachie is owned by the Ellis County company.

The Ellis County Independent Telephone Co. operates the exchanges in Ennis and Waxahachie, and toll lines from Waxahachie to Hillsboro.

The Fort Worth Telephone Co. operates the exchange in Fort Worth.

The Falls County Telephone Co. operates the exchange in Marlin, together with toll lines from Marlin half the distance to Rosebud, and from Marlin half the distance to Waco.

The South Texas Telephone Co. operates the exchange in Port Arthur, the exchange at Nacogdoches, formerly operated by that company, having been sold on November 1st to E. A. Blount. This company operates toll lines from Temple south to San Antonio via Holland, Taylor, Round Rock, Austin, San Marcos and New Braunfels; from Austin to Houst n via Elgin, Giddings, Bernham and Hempstead; from Hempstead to Bryan via Navasota; from Houston to Orange via Crosby, Liberty, Dayton and Beaumont; from Beaumont to Port Arthur.

Dallas Automatic to Double Capacity.

The Dallas (Texas) Automatic Telephone Co. has adopted plans for doubling the capacity of its exchanges in that city. There are now five exchanges having connections for 10,000 telephones. The enlarged plant will provide for 20,000 telephones. It is stated by J. C. Cassler, president of the company, that the work of making improvements will be started in a very short time.

At the recent annual meeting of the stockholders the following directors were elected:

J. C. Cassler, Frank Austin, Rhodes S. Baker, Clarence E. Linz, J. Fred Schoellkopf, Herbert D. Ardrey, C. R. Freeman, Elihu A. Sanger, J. S. Kendall and Harry L. Seay. The following officers were elected: J. C. Cassler, president; Clarence E. Linz, vice-president and secretary;; J. S. Kendall, treasurer. The officers with Rhodes S. Baker and Frank Austin, compose the executive committee.

The company has just issued its third directory, which, as much as anything else, indicates the rapid development of the system. The book contains nearly 350 pages, having a classified business directory and also a numerical arrangement of subscribers' numbers. It is stoutly bound in heavy manilla covers and reflects prosperity from every angle, not only from the number of subscribers listed, but also from the top and bottom lines and half and full page advertisements which are plentifully distributed. Evidently the publication is being handled by a commercial man who appreciates and causes business men to appreciate the advantages of advertising in the telephone directory.

Service Tests by New York Commission.

Inspectors of the New York Public Service Commission are constantly making tests of the service by telephone corporations in various parts of the state. The following table, which shows tests made in and about Albany, is for the year 1912.

Name of Company	Exchange	No. of tests.	Average answer	Average Disconnection.	Average recall.
N. Y. Telephone Co.	Albany	797	6.4	.....	....
Schenectady Home Tel. Co.	Schenectady	22	3.6	4	17.2
Albany Home Tel. Co.	Catskill	21	5.1	63.3	5.7
New York Tel. Co.	Catskill	51	6.7	60	5.7
Columbia Tel. Co.	Hudson	46	3.2	7	14.8
New York Tel. Co.	Hudson	47	5	5.7	5.7
Commercial Union Tel.	Ballston	20	3.1	5	6.5
New York Tel. Co.	Ballston	44	3.4	5.6	5.9
Commercial Union Tel.	Saratoga	46	3.8	3.4	7
New York Tel. Co.	Saratoga	49	4.2	3.4	8.4
Commercial Union Tel.	Schuylerville	15	4.7	130.3	44.2
New York Tel. Co.	Schuylerville	32	4	53.5	11.6
New York Tel. Co.	Baldwinsville	21	4	8.7	4.5
New York Tel. Co.	Mechanicville	58	4.6	4.6	6.9
New York Tel. Co.	Poughkeepsie	39	4	4.2	7.7

The average answer is based on the elapsed time from taking down the receiver and the first answer by the operator. The average disconnection shows the elapsed time between hanging up the receiver and disconnection by the operator, so as to make the wires available for another call and obviate unnecessary "busy" reports. The last column shows the elapsed time between the finish of one call and the response of the operator when another party is wanted. Time is in seconds.

North Carolina Independent Shows Gains.

At a recent annual meeting of the stockholders of the Iredell Telephone Co., of Statesville, N. C., the report of the secretary and treasurer, W. M. Barringer, showed the affairs of the company to be in good condition with a gratifying increase in business during the past year. The regular semi-annual dividend of 4 per cent. was reported as paid.

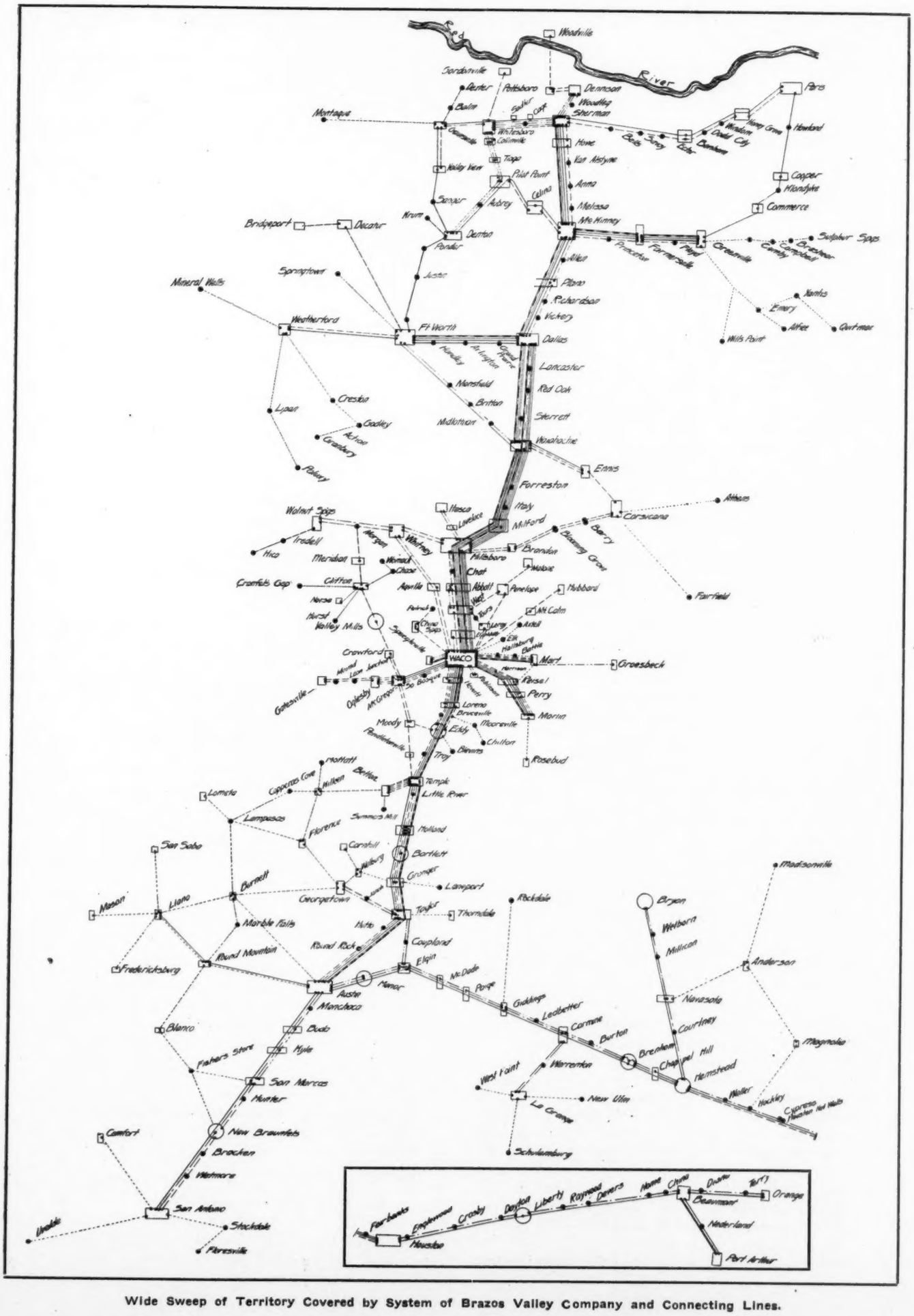
The company now has 879 telephones in Statesville and environs, a net gain of 95 for the year. The local telephones and those on connecting exchanges in the county number 1,666. This does not take into account the connections at Stony Point, Hiddenite, Taylorsville, Catawba and other points outside the county.

The meeting concluded with the unanimous re-election of the present officers and directors, as follows: H. P. Grier, president; E. Morrison, vice-president; Wm. Barringer, secretary, treasurer and general manager; H. A. Yount, S. B. Miller, Wm. Wallace, J. G. Shelton, J. E. King, P. F. Laugenour, R. V. Brawley, R. J. Bryant, R. R. Clark.

Independent Makes Progress in New Castle.

Since the recent raise in rates by the Bell Telephone Co., at New Castle, Pa., the company is losing both business and residence subscribers. The Union Telephone Co. has secured the endorsement of the Board of Trade and is making good progress in building up its local system.

The Independent has approximately three or four stations to one Bell in the adjoining rural districts, another reason for its favorable reception in the city. It has a modern Kellogg common battery switchboard and has most of its cable in the city in the municipal conduits.



Wide Sweep of Territory Covered by System of Brazos Valley Company and Connecting Lines.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

Interstate Commerce Commission's Formal Announcement.

The formal order of the Interstate Commerce Commission relating to the proposed investigation of the telegraph and telephone companies of the country, known on the commission's records as Docket 5462, is as follows:

"Information having been lodged with this commission to the effect that the American Telephone & Telegraph Co., by the operations of itself and allied companies, is attempting to monopolize the telephone and telegraph business of the United States and is fast driving out of existence Independent competitors; and further, that this company and other telephone and telegraph companies are guilty of unlawful discriminations and are imposing unreasonable rates, rules, regulations and practices in the conduct of their business:

IT IS ORDERED that a proceeding of inquiry and investigation be, and it is hereby, instituted into and concerning the history, the financial operations, the rates, rules, regulations and practices of telephone and telegraph companies subject to the act to regulate commerce, with a view to the making of a comprehensive report and to the issuance of such order, or orders, as may be necessary to correct such discriminations and make applicable reasonable rates and practices.

IT IS FURTHER ORDERED that this proceeding be set for hearing at such times and places, and that such persons be required to appear and testify, to afford such information, and to produce such books, documents and papers as the commission may hereafter direct, and that investigation be carried on in the meantime by such means and methods as may be deemed necessary and proper."

Careful reading of this order, says a Washington dispatch to Financial America (New York), will disclose one significant feature, namely, that in turning the matter over to the commission the attorney general took a short cut to seek rectification of alleged abuses by the companies. If he had prosecuted under the Sherman act, there would have been long litigation in the minor courts, and an appeal to the Supreme Court of the United States. In its notice the commission said that the inquiry would be carried on with a view to correcting discriminations, and applying reasonable rates and practices. This can be accomplished by a mere order of the commission. Such an order would be subject to review by the Commerce Court, if that body is still in existence after the new Congress starts work.

The fight over the Commerce Court involved in the appropriation bill providing for its maintenance was but the first chapter in the effort to abolish the court. A bill to that end will be urged when the Democrats get full control of both branches of Congress. It will be strenuously resisted, however, as the transportation interests of the country, and now the wire-transmission interests, will realize what an important body the Commerce Court has grown to be.

New San Francisco Rate Ordinance.

There has been filed at San Francisco a petition signed by more than 10,000 residents of San Francisco for the submission to the people of a proposed ordinance regulating the telephone business and fixing rates.

Representatives of the Telephone Users' Association, which was active in the circulation of the petition say that fully 3,000 additional signatures could be attached if necessary.

It is now the duty of the registrar to examine and pass on the signatures. Should he find them all regular he will report to the board of supervisors, which will have no option except to order the election.

The proposed rates provide for reductions varying from 15 to 20 per cent. in those now in force, and for other regulations designed to make the service more satisfactory.

The proposed ordinance also contains provisions requiring telephone companies doing business to file with the mayor and also with the supervisors within 90 days after the passage of the ordinance, complete inventories and descriptions of all the physical property, including real estate, plant, system connections and apparatus.

Los Angeles Home Favors Commission Control.

Leo Keller, chief engineer of the Home Telephone & Telegraph Co., of Los Angeles, Cal., said this week to a representative of TELEPHONY: "We are well pleased with the extension of the authority of the Railroad Commission of our state, which has given its supervision over telephones. I am confident that nothing but good will result from this move and my company heartily approves of it.

"In my judgment, control by commission will result in the elimination of all discrimination in rates and service, and will go far to promote the profitable operation of telephone properties. While we are under the Los Angeles city commission in our local plant, the state body rules outside the city, and this insures us absolutely against any alteration in our connections with other companies, regardless of where their ownership rests.

"We are making most satisfactory progress in our operations. We had, on the first of the year, well over 52,000 stations connected, a gain of more than 7,000, net, for the year. And the next 12 months should see even greater advancement. I believe 1913 is going to be a banner year for the telephone business."

Public Service Commission for Texas.

A bill creating a state public utilities commission has been introduced in the Texas legislature by Dwight L. Lewelling. The measure, which has been patterned largely after the public utilities laws of the state of Wisconsin, provides that the public utilities in Texas shall be placed under the control of a separate commission composed of three persons, to be elected by the Senate and House of Representatives in joint session.

The commission is to have adequate powers, and the proposed law provides for appeals from its orders to the courts, but forbids the setting aside of any order or suspension thereof by injunction pending the decision of the court. One of the most important features of the proposed law is the placing of every franchise within the state under the commission and so altering or amending any franchise as to make it in effect an indeterminate one. All franchises are, of course, granted by local authorities, but should the measure become effective none can be hereafter granted for any definite length of time.

Bill Creating Illinois Utilities Commission.

A bill for the regulation of public utilities has been introduced in the Illinois Senate. The bill creates two distinct commissions of five members each, one to have jurisdiction in the city of Chicago and the other in the state outside of Chicago. The Chicago commissioners are to be appointed by the mayor and the state commissioners by the governor. The commissioners are given jurisdiction over all surface, elevated, and underground railroads, express, sleeping cars,

freight line, gas, electric, telegraph and telephone companies. The commissioners are to receive a salary of $10,000 a year each.

To Appeal Evansville Franchise Action.

The decision of Judge F. M. Hostetter in the superior court at Evansville, Ind., a few weeks ago, upholding the board of public works in its refusal to grant a franchise to the Independent Telephone Co., is to be appealed to the Supreme Court of Indiana.

The question to be decided by the supreme court is whether the contract awarded the Cumberland Telephone & Telegraph Co. can be taken as a general ordinance by which every other telephone company may enjoy the same privileges.

The Independent Telephone Co., in its suit to mandamus the board of public works to grant a franchise, in substance alleged that the contract awarded the Cumberland company was a blanket ordinance which will cover the entrance of another telephone company into the city.

The company holds it is not discretionary with the board whether it shall grant a franchise, but that any company applying must be granted the privileges accorded the Cumberland company. Judge Hostetter refused to uphold the Independent company's contentions.

The Independent company maintains that public sentiment demands a second telephone line in Evansville and that a petition signed with several hundred names and presented to the board proves this point.

Commission Reduces New York Rates.

The New York Public Service Commission has ordered the New York Telephone Co. to desist after February 1, 1913, from charging any rate for messages between Great Neck and Floral Park and Manhattan borough in excess of 15 cents a message, and to reduce its message rates between these stations by not less than 5 cents a message. The company is also required to make such changes in its toll rates between Great Neck and Floral Park and parts of the city of New York, other than Manhattan, as may be necessary to bring the rates in line with those at other stations, which also take a 15-cent subscriber's rate to and from Manhattan.

Ohio Commission Authorizes Interconnection Contracts.

The Ohio Public Service Commission has authorized the renewal of an agreement between the Swanton Home Telephone Co. and the Central Union Telephone, providing for interchange of service. It is provided that all other existing connections with other systems shall also be continued. A similar order has been handed down affecting the Central Union and the Delta Home Telephone Co.

Fermission has been given by the council for the execution of interconnection contracts between the Central Union and the Adamsville Telephone Co., and between the Richwood Telephone Co. and the Union County Farmers Telephone Co.

Protest Merger at Indianapolis.

The Central Labor Union, of Indianapolis, through its telephone committee, has secured 7,000 signatures to a petition remonstrating against the merger.

F. R. Millar, secretary of the committee, says he has endeavored to get a hearing from the board of public works, but has been ignored and now insists on being heard by the city council. He also says he wrote Mayor Shank asking that the committee be heard in the matter and that the latter replied through his private secretary, stating he will not take action in granting the franchise without first thoroughly going into the matter.

Call Words Instead of Numbers.

Following the decision of the New Jersey Public Utilities Commission, to the effect that it was desirable for greater convenience to substitute call words for numbers in many instances in telephoning, a resolution is being prepared by the commissioners that will ask the local telephone companies to substitute call words for a number of places in this city.

It has been suggested that business would be facilitated if the person calling might simply ask for "City Hall," "State House," "Court House." "Fire Headquarters," "First Precinct Station," "Second Precinct Station," "Mercer Hospital," "St. Francis Hospital," "McKinley Hospital," "Post Office," "State Hospital," "State Prison" and other buildings of similar public character that are frequently called.

It is also said that this would be a great benefit to strangers to the city, who are either compelled to hunt up a telephone directory or make an extra call or "Information," in order to get the desired number. This search for numbers is, it is said, always at the cost of time, and, therefore, it would be a great convenience for the public if call words could be substituted.

Lowers Rates of Ohio Company.

The Clinton (O.) Telephone Co. has been ordered by the Public Service Commission to abate certain charges for rural services and to substitute others in their stead. It has also been ordered to place its lines and exchanges in condition to give good service to all applicants. The rates which the commission ordered discontinued were as follows:

Residences in county on 10-party lines, per month:

Under four miles from exchange	$1.00
From four to six miles	1.25
From six to eight miles	1.50
From eight to 10 miles	1.75
From 10 to 12 miles	2.00

Business houses in county 50 cents more in each case.

The rates which the company must hereafter enforce are these:

Within four miles of an exchange	$1.00
From four to eight miles	1.25
From eight to 12 miles	1.50
From 12 miles up	1.75

Business house 50 cents more in each case.

The company is required to "establish and be prepared to furnish to all persons and patrons applying therefor individual, or single line, rural service at just and reasonable rates." It is also instructed to install a "new and adequate" switchboard at its Wilmington exchange; to replace, or put in good repair, all lines out of its Sabina exchange, as well as all its lines in whatever part of its system; and to file with the commission before March 1, 1913, a schedule of reasonable single line rural rates.

Oregon Company Asks Rate Regulation.

Asserting that the rates charged by the Eastern Oregon Co-operative Telephone Association, of Elgin, since its organization about a year ago, are unjust to competitors, discriminatory as to some of its subscribers and preferential as to others, entirely insufficient to meet its operating expenses, and that if it is allowed to continue its present rates and practices, the entire telephone industry in the local and neighboring communities will be demoralized, the Home Independent Telephone Co., of La Grande, Ore., has filed a lengthy complaint with the Railroad Commission of Oregon. By the passage of the bill known as the Malarkey bill, the people of the state at the last election conferred jurisdiction upon the Railroad Commission to

regulate and control rates and service of public utilities in Oregon.

The Home company complains that, inasmuch as the Malarkey act requires strict compliance of it in the way of uniform rates to all for the same service, and that, inasmuch as it is powerless to change its own rates without an order from the Railroad Commission, the stockholders of the Home company are entitled to be protected from competition which it claims is unjust and unreasonable.

Would Repeal Giles Law.

A bill has been introduced at Lansing, Mich., by Representative John Schmidt, of Osceola county, for the repeal of the Giles law, which created the Public Utilities Commission.

Schmidt says the little companies have gotten the worst of the deal from the moment the law went into effect and he promises that much of the grange influence which was so active two years ago in passing this measure this year, will be directed in favor of the repeal of the bill.

To Cut New York Suburban Rates.

Reductions in the toll rates between New York City and suburban districts of New Jersey, Westchester and Long Island will be made by the New York Telephone Co. The time when they are to go into effect has not been fixed. The cuts will be from 10 to 40 per cent. The reduction will reduce the company's immediate revenues at a rate of $600,000 a year, but it is expected that this will be counterbalanced by increased business.

The present rate between New York and Newark is 20 cents; under the new schedule it will be 15 cents. The rate to Jersey City will be cut from 15 to 10 cents. According to the telephone company's announcement, there is no present intention of reducing the public rate to Brooklyn or the subscribers' rates by the year in any of the boroughs of Greater New York.

Want Provincial Ownership in Toronto.

Provincial control and operation of the telephone systems in Ontario was strongly advocated by the representatives of the Trades and Labor Congress in their annual call upon the Ontario government officials.

The proposal was answered by the prime minister, who objected on the ground that the possession of Dominion charters by the telephone companies would render provincial action difficult. It was urged, however, that the province could enter into negotiations with the Bell Telephone Co. to take over its lines in Ontario.

Bill Introduced Against Advance Payment.

A bill has been introduced in the Wisconsin assembly by Assemblyman J. F. Smart which, if passed, will put a stop to the collection in advance of telephone rentals. Smart holds that the telephone company has no right to ask patrons for the cost of three months' service before the service is received.

Oklahoma Commission Cases.

That rural party telephone lines shall pay switching charges in advance, quarterly, and that the telephone company has the right to discontinue service for non-payment, is the substance of an order just promulgated by the Oklahoma Corporation Commission.

In making the rule, the commission stated that it had sought to agree upon a reasonable plan and that, if objectionable features arise later, such questions will be heard and acted upon.

Complaint has been filed with the commission by George A. Davenport, owner and manager of the Choctaw Telephone Co., against the pioneer Telephone Co., charging that he could not get connections with the defendant corporation. In his complaint he states that the Pioneer company will not connect with his line at Soper.

Wisconsin Commission Fixes Rates.

The Wisconsin Railroad Commission has entered an order allowing the Melville Settlement Telephone Co., operating in Chippewa county, to increase rates from $9 to $12 a year. An order has also been issued in the case of the Rockland Telephone Co., of Rockland, fixing an annual rental of $9, with a refund of $1.50 to persons owning and maintaining their own telephones. The company is also directed to manage its affairs so as to cover an annual depreciation of 7 per cent. on the cost of the plant.

Hearing at Oneida, N. Y.

The New York Public Service Commission has notified the Oneida, N. Y., Chamber of Commerce that on February 21, in that city, there is to be a hearing before Commissioner Decker on the complaint made against the New York Telephone Co. some time ago by the Chamber of Commerce, in which objection to rates and service in this city were made and the investigation of the commission sought. The complaint was filed three years ago.

Resists Pole Ordinance in Camden, N. J.

Application for a writ of certiorari has been made to the New Jersey supreme court by the Delaware & Atlantic Telegraph & Telephone Co. to review an ordinance passed by the common council of Camden, July 25, 1912, regulating the erection of poles and providing that the city be permitted to use the poles for municipal service. The purpose of this measure was to enable the city to use the poles of the telephone company for stringing wires for fire alarms and police purposes.

National Telephone Sale Decree Suspended.

The decree of foreclosure and sale handed down by Federal Judge Dayton, in the case of the Commonwealth Trust Co., of Pittsburgh, trustee, against the National Telephone Corporation, of Wheeling, W. Va., has been suspended by Judge Dayton until March. General T. S. Reilly, counsel for the trustee, asked leave to file exceptions to the answer of A. J. Howard, and the order of suspension was entered until arguments can be heard.

New Jersey Bars Call Word "Telegram."

An order, issued by the New Jersey Public Utilities Commission, prohibits the New York Telephone Co. from using the word "telegram" as a call word for the Western Union Telegraph Co. or any other telegraph company within the state. The Postal Telegraph-Cable Co. is responsible for the order, having complained that the call word "telegram" worked an illegal discrimination in favor of the Western Union Company.

Would Regulate Rates in New York City.

Two bills regulating telephone rates have been introduced in the New York Assembly. One calls for a flat five-cent rate between all points in the Bronx and Manhattan. The other bill seeks to prohibit a charge for telephone calls at hotel stations in excess of the regular public station charge.

Asks Rate Investigation of New York.

A resolution introduced by Assemblyman Weil, of New York City, calls for an investigation of the New York Telephone Co. by the Pubic Service Commission to determine an equitable flat annual rate based on the company's actual investments.

Practical Subjects—Letters and Discussions

Why Telephone Directory Advertising Is Effective.

Telephone directory advertising is effective because it is continuous and persistent. It demands and receives attention, and the advertiser's story is told again and again to an audience that is constantly increasing, says The Pacific Telephone Magazine.

As an advertising medium the telephone directory occupies a unique field, and, unlike any other medium, its circulation is continuous as well as large.

The directory is in constant use day and night and reaches the greatest possible number of prospective buyers of all classes.

It is consulted by the housewife, who orders her supplies by telephone, as well as by the merchant who purchases his stock by the carload. Telephone subscribers represent the buying class, and their patronage is one of the most desirable assets of the merchant. The placing of orders by telephone is steadily increasing, and this class of trade is greatly desired by all business men and special provision made to care for it.

Space in the telephone directory is valuable to the advertiser who is conducting a general advertising campaign and who wishes to keep prominently before the public his name, location or brand of goods. In mapping out an advertising campaign, the telephone directory is now usually considered in the plans, which indicates the growing popularity of telephone directory advertising as a means of publicity.

That a large proportion of the advertising in the telephone directory produces satisfactory results is evidenced by the fact that 90 per cent. of the advertisers renew or increase their contracts for space.

Comparative Range of Copper Metal.

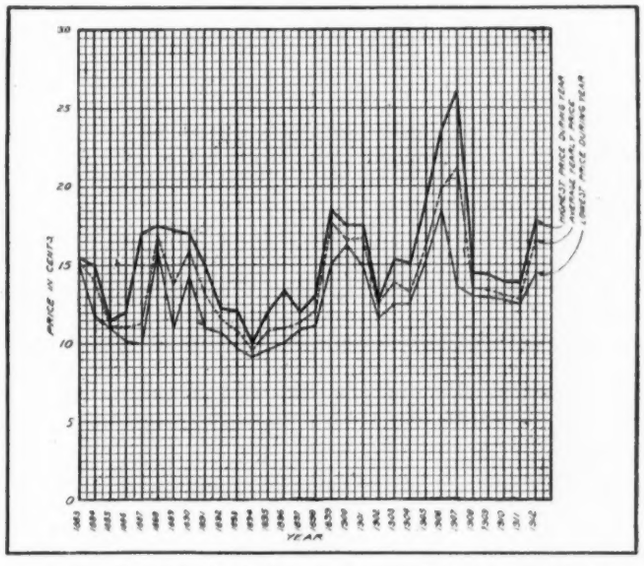
The accompanying table, compiled by the Rome Wire Co., of Rome, N. Y., shows the average monthly prices of copper from 1883 up to the first of this year. It also shows

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly Average
	Cts.	Cts.	Cts.	Cts.	Cts	Cts.	Cts.	Cts.	Cts.	Cts	Cts.	Cts	Dollars
1883							15¼	15½	15¼	15¼	16	15	
1884	15	15	15	15	14½	14½	14⅝	14	13⅜	13⅛	13	11⅞	.14031
1885	11¼	11¼	11	11	11½	11⅝	11⅝	11⅛	11⅛	11	11	11¼	.11166
1886	11½	11½	11½	11½	10⅞	10¼	10⅜	10⅜	10⅜	11⅜	12	12	.111458
1887	11⅝	11	10¾	10½	10	10	10⅝	10⅜	10½	10½	12⅝	17	.11323.
1888	16½	16⅜	16	16⅝	16⅝	16½	16⅜	16⅜	17¼	17¼	17½	17¼	.16781
1889	17⅛	16¾	16½	16½	12½	12¼	12	12	11½	11	12⅝	14¾	.137395
1890	14½	14¼	14¾	14½	15	16¼	17	17	17	17	17	16	.15812
1891	15	15	14	14	13½	13	13	12⅜	12½	12¼	11½	11	.13093
1892	11	10⅜	11¼	11⅞	12	12	11⅜	11⅞	11¼	11⅜	12	12¼	.11625
1893	12¼	12	11⅞	11½	11	10⅞	10⅜	9⅜	9⅜	9⅜	10	10⅜	.10781
1894	10	9⅜	9⅜	9½	9⅜	9¼	9¼	9¼	9½	9⅜	9¼	9⅞	.096416
1895	10	9⅞	9⅜	9⅜	10½	10⅜	11¼	12	12	12	11½	10⅜	.10812
1896	10	10⅜	11	10⅞	11⅜	11⅝	11¾	11	10⅜	10⅜	11⅝	13⅜	.10979
1897	11⅞	12	11⅜	11½	11	11⅛	11⅜	11¾	11⅛	11⅛	10⅞	11	.11333
1898	11¼	11⅜	12	12	12	11⅞	11⅝	12	12⅜	12½	12⅜	13	.12062
1899	15	18	18	18⅜	18½	18¼	18½	18½	18½	18	17¼	16⅜	.17802
1900	16½	16¼	16⅜	17	16⅜	16¼	16½	16⅜	16⅜	16⅜	16⅜	17	.16656
1901	16⅞	17	17	17	17	17	17	16⅜	16⅜	16⅜	16⅜	14⅜	.16729
1902	11⅜	12⅜	12⅜	12¼	12⅜	12½	12¼	12	12	11⅞	11⅜	11⅜	.12135
1903	12½	13¼	14⅜	15¼	15	14⅜	13⅜	13⅝	13⅜	13⅜	13¼	12½	.13791
1904	12⅜	12½	12⅜	13⅜	13¼	12⅜	12⅜	12⅜	12⅜	13⅜	14⅞	15¼	.1325
1905	15½	15½	15½	15⅜	15¼	15¼	15¼	16	16⅜	16⅜	17¼	19	.16093
1906	18⅜	18½	18⅜	18⅜	18⅞	18⅞	18⅜	18⅞	19½	22	22⅜	23½	.19812
1907	25¼	25⅜	26	26	26	26	23	18½	16½	13⅜	13⅜	13⅜	.21177
1908	14	13¼	13	13	13	13	13	13⅜	13⅜	13⅜	14½	14½	.1354
1909	14⅜	13¼	12⅞	13	13¼	13½	13½	13½	13¼	13¼	13⅜	13⅜	.1342
1910	13⅞	13⅞	13⅜	13½	13	13⅜	12⅜	12⅜	12⅜	12⅞	13	13	.13135
1911	12⅞	12⅜	12½	12½	12⅜	12⅜	12⅜	12⅜	12⅜	12½	12⅜	13⅞	.1275
1912	14¼	14½	15	16	16⅜	17½	17⅜	17⅜	17⅜	17⅜	17⅜	17⅜	.16708

Monthly and Yearly Average Prices of Copper Metal.

the yearly average price. In looking over this table it will be noticed that in some years there was considerable variation between high and low average prices during the various years and that the yearly average has varied from 9½ cents a pound to 21 cents. The average price for the past year was about 16¾ cents a pound.

A curve has been drawn by TELEPHONY, showing the lowest prices for copper (light line), beginning with July, 1883, up to and including 1912; another showing the highest prices is indicated by the heavy lines. The average yearly price of copper covering the same period is indicated by the dotted lines. In looking over these curves, it will be seen that a fair average is in the neighborhood of 15 cents a



Curves Showing Variation in Copper Prices in 30 Years.

pound. It will also be noted that copper has reached a maximum about every seven to ten years and that the price has remained high for a period of two to three years, when it takes a sudden drop.

Simple Scheme for Keeping Tab on Collections.

L. B. Eaton, manager of the Federal Telephone & Telegraph Company's exchange at Wellsville, N. Y., has a novel and simple method of keeping in daily touch with his collections. He uses cross-section paper in which each large square represents $50 and the smaller ones, $5. On the vertical line, starting from the bottom, the larger squares are marked $50, $100, $150 and up. One vertical line is used for rental collections and the other for tolls.

Upon receipt of information from the Buffalo office as to the amount of money he should collect during the month, Mr. Eaton draws a red line from the bottom up to that amount. At the end of each day he puts in on this vertical line, the date opposite the small square which indicates the total amount collected up to that date. In this way, he knows each day just how much he has collected and has memorandum constantly before him as to whether he is keeping up or bettering his exchange collections. In fact, he knows just where he stands. The detail of keeping up a memorandum of this kind takes but a moment or so each evening.

An Aunt's Letters to a Switchboard Girl.

SELF IMPROVEMENT OR ARISTOCRACY OF KNOWLEDGE.

My Dear June:

Did you ever read Archibald Lowe's criticism of a certain author? "Most people," he says, "experience a feeling of relief when they succeed in getting any sort of an undertaking fairly under way, whether it be reading or writing. But, upon him the effort of making a start seems to exercise an irresistible fascination."

Now, if you will have patience with me, in this my hobby, I want to tell you that the start in any new pursuit is fascinating. It is the dogged, persevering application day after day, in study, as well as in any work, that tries the stuff our resolutions are made of.

Right now, regardless of my reputation as a ready writer of social letters, my mind is wandering, and following my eyes. Through the open window the soft wind blows. The sun is warm and bright. Across the street some one is getting the garden plot in shape for early planting. That carries me miles and miles away to the prospective farm we plan to homestead, and become landed aristacracy. Then it brings me back to the matter in hand, as I want to tell it to you.

There is but one aristocracy to my mind, and that is the aristocracy of knowledge. How to reach that is your problem, when your free time comes so by snatches. But you remember, "He who runs may read."

Have you noticed the new calendars upon your wall? Glance at the one from the new bank. Have you noticed the bank's capital and the list of the board of directors? Eighty thousand dollars—that sets you thinking and wondering about the other banks of your town. So, you turn about and study the others in turn. At any time a question on the subject may suddenly come to you and it gives you a glow of pleasure to be able to give an off-hand answer on so important a business in your town.

The other day a neighboring town asked for the population of our town. The operator flushed, but not with pleasure, when she had to wait to call the mayor to get an answer for the question.

In reading one short sentence the other night, the same young woman started a train of thought that will be with her always. A man from a magnificent desolation in the West, describing his impressions of a great city said: "In towns everybody you meet is either your enemy, or he does not care about you!"

There is a whole volume of the greatest study in the world laid open for you; one you cannot elude or evade if you try ever so hard, the old and ever new—humanity.

Coming down again to the commonplace. Do you read your local paper? Do you know all about the market fluctuations? It is expected of you. It is a duty you owe to the rural subscribers, as a representative of your company.

The sporting news is enthusiastically followed by many on your lines. Though we may feel a reluctance in telling it, you must be the first to know that in the final baseball games of the season your favorite team was beaten nineteen to nothing.

That for local study, for a beginning. Then do you, June, get the benefit and instruction of good telephone literature? If telephone periodicals lie about the office, pick them up and look through them. You have no idea what an increase of interest it gives you in your work. The technical part may, at first, be as Greek to you, but in time even that begins to fit in.

Have you read or thought of the legal complications that may arise from the carelessness of a switchboard operator? A delayed message may furnish grounds for a damage suit against your company. It is well to find and read some cases in point concerning other lines. Of course you need not take up a law course, but take notice of everything that concerns your special work, for today, more than ever, one must be a specialist.

Most of our knowledge is second hand, so let your mind remain in a receptive state toward advisers, for experience, like the stern lights of a ship at sea, illumines the waters that are passed over.

There was never a time when there was such need of social culture for the masses of our citizens. Practical efforts must be guided by education. We must be able to make out the melody when some one greater has struck the keynote, to bring our best thought into shape, as iron filings at the approach of a magnet, ripen thought into action and make it manifest.

And how, you ask, are you to acquire this treasury of beautiful thoughts, of intellectual beauties? It is taken for granted that you mold into your thought only right things, for they will harden into permanent form, and how can one be satisfied if the form be ugly?

Read outside your own line of work, in addition to knowing the ideas of the masters of your peculiar occupation.

"Read what?"

Read history. No study may be made to touch life more closely, nor better interpret the conditions of the present through a knowledge of the past. Keep some good history in easy reach. So many moments may be utilized. This is a thought developer. Also it cultivates judgment, and may help you to shun the conditions that Pope attributes to man.

"In man the judgment shoots at flying game,
A bird of passage, gone as soon as found,
Now in the moon, perhaps,
Now underground."

"What else?"

Language, and still more language, should be your daily study. Do you remember this from your English teacher:

"A pure language bears witness to corresponding merits in those that speak it; to clearness of mental vision; to strength, to harmony, to nobleness in them that has gradually shaped it to be the utterance of their inmost life."

You draw a long breath. It does sound heavy—I know it—but you have the opportunity to do this for yourself, and remembering your industrious self, I know that you will conquer these conditions, by toiling awhile, enduring awhile, believing always and never turning back.

Your AUNT.

Prolonging Life of Jacks on an Old Switchboard.

We had a lot of trouble with noisy lines, cut-outs and cracks in the ear. Also when a connection was made in the multiple at different parts of the board, the light would come in at the answering jack of the line called, and then there would be confusion between the operators and subscribers.

At first we put all new plugs on the cords and cleared the jacks as best we could. From this work we obtained very good results and the effects of which lasted a little over a year. Then again we began to have the same trouble. We did not want to get new plugs again, for we thought it would not pay. We communicated with different switchboard manufacturers to learn if they had any instrument for cleaning jacks and were unable to get one. So we bought, for a very small amount of money, a second-hand dental engine, which was run by foot power, and connected it to a fan motor. Then we bought several bristle brushes, such as are used for cleaning revolvers, and placed one of them in the drill. The brush revolving in a jack cleaned and brightened it. This has given the best results of anything we have yet tried.

Hamilton, Ohio. J. B. Walker, Wire Chief,
The Hamilton Home Telephone Co.

Some Interesting Construction Work.

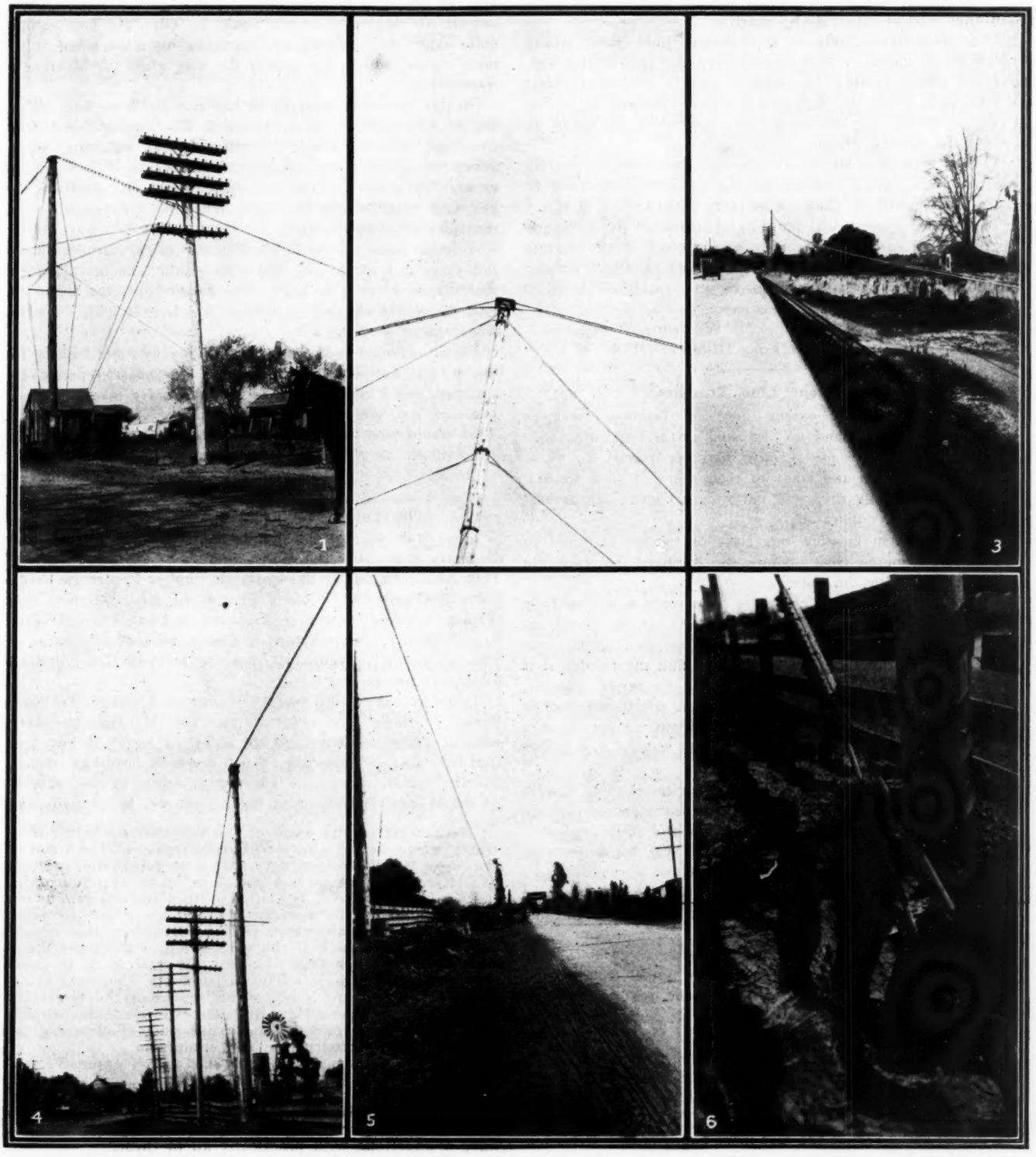
It may be interesting to your subscribers to read a description of the permanent repairs which were made in the lines of the United States Long Distance Telephone & Telegraph Co., of Los Angeles, Cal., lines at the point shown in the article, "Unusual Methods in Repairing Telephone Lines," which was recently published in TELEPHONY.

and which showed our use of a small cannon to get across the river.

The Lexington Wash, as the river is called on the government topographical maps, is, as was stated in that article, only a bed of sand during the summer months, but after one of our rains it becomes a raging torrent of 400 to 500 ft. in width. At the time the pictures in the previous article were taken, however, the high water cut away the banks until the new channel became nearly 1,000 ft. across, taking with it our toll lines, 20 in number, and several local circuits belonging to the neighboring exchange.

Temporary repairs were made as before described, and the lines put back into service with only a few hours interruption. Several methods of crossing the river were discussed, but the final decision was in favor of a long span of aerial cable.

The illustrations accompanying this article fail to give



RIVER CROSSING CONSTRUCTION OF UNITED STATES LONG DISTANCE TELEPHONE CO., NEAR LOS ANGELES, CAL.
1. Cable Pole and Support Pole on Eastern Bank of the Lexington Wash—2. Looking toward Top of Support Pole—3. Western End of Span, Less than One-half of Span is Shown—4. Support Pole and Cable Pole at Western End—5. The 1300-ft. Span Looking Toward the East—6. Messenger Attachment at Western End.

an exact idea of the span, due to its extreme length, but the following dimensions will assist somewhat:

The span between the supporting poles is 1,375 ft. We are using a 50-pr., 19-gauge, paper insulated cable, which is attached to the messenger by special made cable rings, and anchored at intervals by marlin.

The messenger itself is a 19-strand plow-steel strand 15/16 in. in diameter. It passes over the top of the supporting poles, resting in saddles, and is anchored about 100 ft. back from the supporting poles. Owing to its extreme stiffness, the messenger is required to be made up on a 16-in. sheave wheel.

The extreme sag which we allowed for is approximately 40 ft., and a daily variation of sag of from 4 ft. to 5 ft. takes place with the changes in temperature.

The cable, 1,500 ft. in length, is protected at each end by fuses and carbon protectors, and though in the middle of our lines, has no appreciable unbalancing effect on our phantoms, which are superimposed on nearly all lines in the lead in question.

Los Angeles, Cal. F. W. Tenny, Wire Chief.
U. S. Long Distance Tel. & Tel. Co.

Intermittent Line Troubles.

On toll lines of any extent there are frequent cases of trouble which "come and go," causing no end of annoyance to all parties concerned. I have had opportunity to chase some of these down and many of them were of such unusual nature that probably they will never occur again, but several I recall might be duplicated.

The difficulty in locating this class of trouble is found in the trouble "coming clear" before the lineman can reach the point designated by the tester.

Some years ago before clearance of wires was as carefully considered as it now is, a certain toll line circuit would become "partial short" nearly every evening and again come clear in the morning. I was directed to find the trouble if it "took a week." On the second evening the tester told me, just after nightfall that I was not far from the trouble and to "camp" until morning and call in at daylight. I put up at a farm house for the night and at daylight was on a pole and found the trouble was still "on."

"Go west half a mile and call again," the tester said. I went west and not two spans away found the wires passed through a fork of a tree. They appeared to have the necessary clearance, but upon climbing the tree, I found that the wires were connected by a mass of a spider's web, which was moist from dew. While I did not suppose at the time this had caused the trouble, I brushed the web away and went down the line and called in.

"What did you find?" inquired the tester.

"Oh, nothing. Just brushed away a few spider webs."

"Well, she came clear like a flash about five minutes ago, while I was watching the galvanometer. It generally dies out gradually."

The trouble never came again.

There was another case that gave us many sleepless hours. A slight or heavy ground would come in on various wires of a lead carrying important Morse leases. Frequent "busts" in the Morse service made the case more aggravating. It became so bad that it was advisable not to attempt to route leases that way. The testers admitted that their measurements were uncertain, and the trouble continued to come and go. On a rainy morning the tester advised that a certain wire was grounded dead, eight miles west.

In front of a school house about that distance out, I found a group of children standing under the line, daring one other to touch a small piece of wire which hung from the line.

From the buggy I took in the situation. A little black-eyed Thomas Edison Westinghouse Tesla had secured a piece of enunciator wire, attached a grab hook of iron wire to one end and an iron spike to the other. He advised me that he had been engaged for some time past in selling "shocks" to the other children. His method was to cast his grab hook into the lead and by taking hold of the spike, the Morse pulsations or ringing generator could be felt. He had become quite expert in removing and recasting his hook when pulsations ceased, which was usually the case when the Morse was transferred.

On this particular morning he had met his Waterloo. When the hook struck the lead the shock had knocked him "end over end," he explained. Whether it was lightning, static, generator or Morse he encountered makes little difference; the ground being wet and the insulation of his wire defective, he got what was coming his way. When he dropped the wire, the spike stuck in the mud.

He generously offered all his ill-gotten gains, marbles, knives, red glass and all, to any one who would take his apparatus from the line but to no avail. The demure little teacher promised she would see that no further interference with the wires would occur.

The troubleman had passed this point many times looking for the trouble but unfortunately not at intermission periods of the day, and Little Johnny Wise had always taken his hook and wire into the schoolroom with him between intermissions. This would have been the case on this day also had he not received such a surprising jolt

Chicago. James F. Prendergast.

The Telephone in Forest Fire Fighting.

The report of A. W. Laird, president of the North Idaho Forestry Association, on the operations of the season of 1912, as conducted by the Potlatch Timber Protective Association, Clearwater Timber Protective Association, Coeur d'Alene Timber Protective Association, Pend d'Orielle Timber Protective Association of Idaho, tells of the value of the telephone in reducing the fire loss in the Northern Idaho timber country.

There are over 4,000,000 acres embraced within the boundaries of these four associations. Of this area the association members own 1,480,000 acres, or about 37 per cent. and this area is increased 178,000 acres by holdings of non-members who contribute varying amounts to the support of the work. Referring to the telephone, Mr. Laird says:

"No feature of the work of the associations better illustrates our constant effort to keep abreast of the times in the most approved practice, than our telephone systems. While last year we owned but 57 miles of telephone lines, this year we have over 163 miles of lines constructed, owned and operated by the associations, and there are no better constructed lines anywhere in the forests of this or any other country. Much of the wire is No. 9 and none that I know of is smaller than No. 10. All wire is B. B. grade and heavily galvanized. The instruments, electrical equipment, appliances and supplies, all represent the latest and highest types in their class and our experience has already demonstrated the economy and satisfactory efficiency of this high quality of construction and equipment.

While 163 miles may not seem like a very extensive telephone system, it must be borne in mind that 18 months ago we had none. It should also be remembered that much of our territory is cobwebbed with farmers' and settlers' lines, besides those of the larger telephone companies. We have connections with practically all of these.

In the light of what experience we have had, I feel that, next to plenty of well constructed trails, no money can be spent to better advantage in the protection of our timber than in building good telephone lines and equipping them with the best instruments and appliaces we can buy.

We have $9,000 invested in these lines, which cost us about $50 to $60 a mile, including all equipment, labor, supervision and overhead expense."

This is but one of the many utilizations of the telephone where its value is being recognized and its sphere extended.

Railway Telephony—Practical Points in All Branches

A Regular Department Which Appears Bi-Monthly—Scope Includes Principles of Construction, Testing, Operation and Maintenance—Columns Open for Contributions on Matters of General Interest to Those Engaged in This Branch of Telephony

Insulation of Telephone Train Dispatching Lines.

By J. A. Kick.

Insulators serve the purpose of separating the current carrying circuit from other current carrying mediums. The standard glass insulator gives a fixed separation between the circuit and other surfaces. It is calculated to furnish an approximate fixed resistance between the conductor and the supporting pin or bracket, provided, however that the tie is correctly made and all other physical requirements are complied with.

Specifications which cover types and methods are founded upon standards, which have for a base the exposed area of the insulator, i. e., the distance from the wire groove to the point where the glass contacts with the pin measured on the surface of the insulator as shown in Fig. 1; the nature of the glass and its glazing; the style of the glass and its means of support; etc.

While every means is exhausted to insulate the line proper, due care is not taken to extend this same high standard to all of the branch lines with the result that

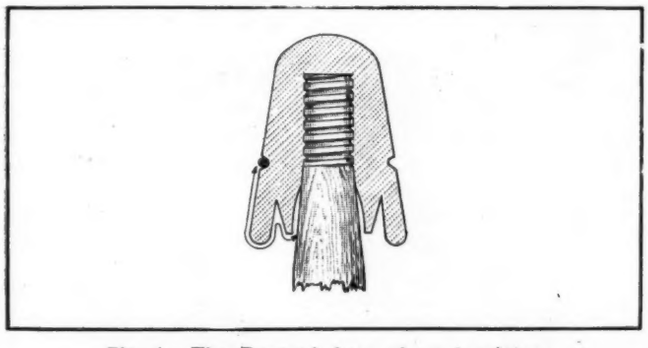


Fig. 1. The Exposed Area of an Insulator.

the insulation is collectively low. Every office loop or bridging drop is a branch line of varying length and must be added to the sum total of the circuit as a capacity to accumulate leaks due to poor insulation. Office loops and drops are very often run across tracks and exposed to worse conditions than the open line wires which take regular pin positions in the standard manner on the main lead.

Many leading-in wires are in twisted pairs or single insulated wires. These are soldered direct to the line wires and, without weather loops through cable boxes or other means of creating a dry surface point on them, are run on small knobs. In many places these wires contact with surfaces having little or no insulation resistance. Referring to Fig. 2, and assuming a line with 20 stations into a number of which the line is looped for test, with an average of 100 feet of twisted pair wire exposed at each station, there are, say, 3,000 feet of insulated twisted pair wire. The surface of this may be assumed equivalent to five miles of the line wire which we are very careful to insulate to a high standard.

These leading-in wires must necessarily contact physically with the line wires, and unless some means is devised for providing a halting point there is a surface leakage at various points, as shown in Fig. 3.

Twisted pairs run through cable boxes and given weather loops where the pairs leave the box on the line wire side, present no greater surface leakage possibilities than do cable strands. But the term "insulated wire" has caused a tendency to neglect the precautions which are exercised in handling the line wire. It is perhaps true that

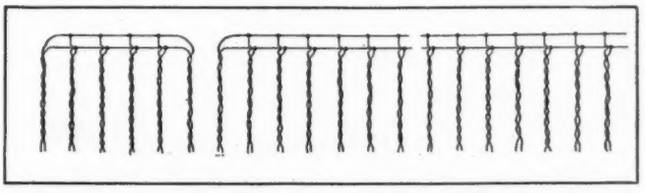


Fig. 2. Twisted Pair Drops and Loops Aggregate Many Miles.

the insulation resistance of any given loop or drop may be relatively high when unfavorable weather conditions are considered, but the cumulative effect of a large number of such loops or drops may be so serious that frequent inflectual attempts to locate poor insulation may be accounted for in this way.

Insulation becomes of greater moment when high voltage telegraph circuits are operated over a telephone circuit, either composited or simplexed. If the circuit is composited, the high voltages will tend to further decrease the insulation resistance of one or both wires, producing a noisy telephone circuit and perhaps causing the telegraph to be inoperative. A simplex circuit presents a double capacity for leak. While the possibilities of breaking down the insulation are not as great as on the composite circuit at the same voltage, yet the general effects are the same in a somewhat lesser degree.

While the usual high standards of insulation should be maintained on the line wire proper, it might be well to use extra care in the insulation of leading-in wires, as it is there that unusual conditions are encountered. On loops and drops, difficulty of inspection is experienced. The original construction job should therefore receive special attention.

The proper operation of selective signaling equipment must necessarily be on a basis of a specified current per unit of equipment, with allowable margins of variations. While these allowable variations or safety factors are purposely made to cover as great a range as possible,

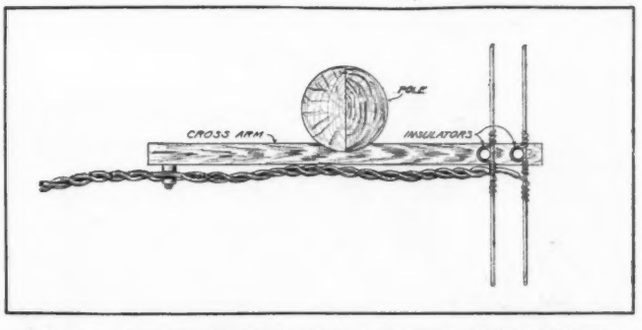


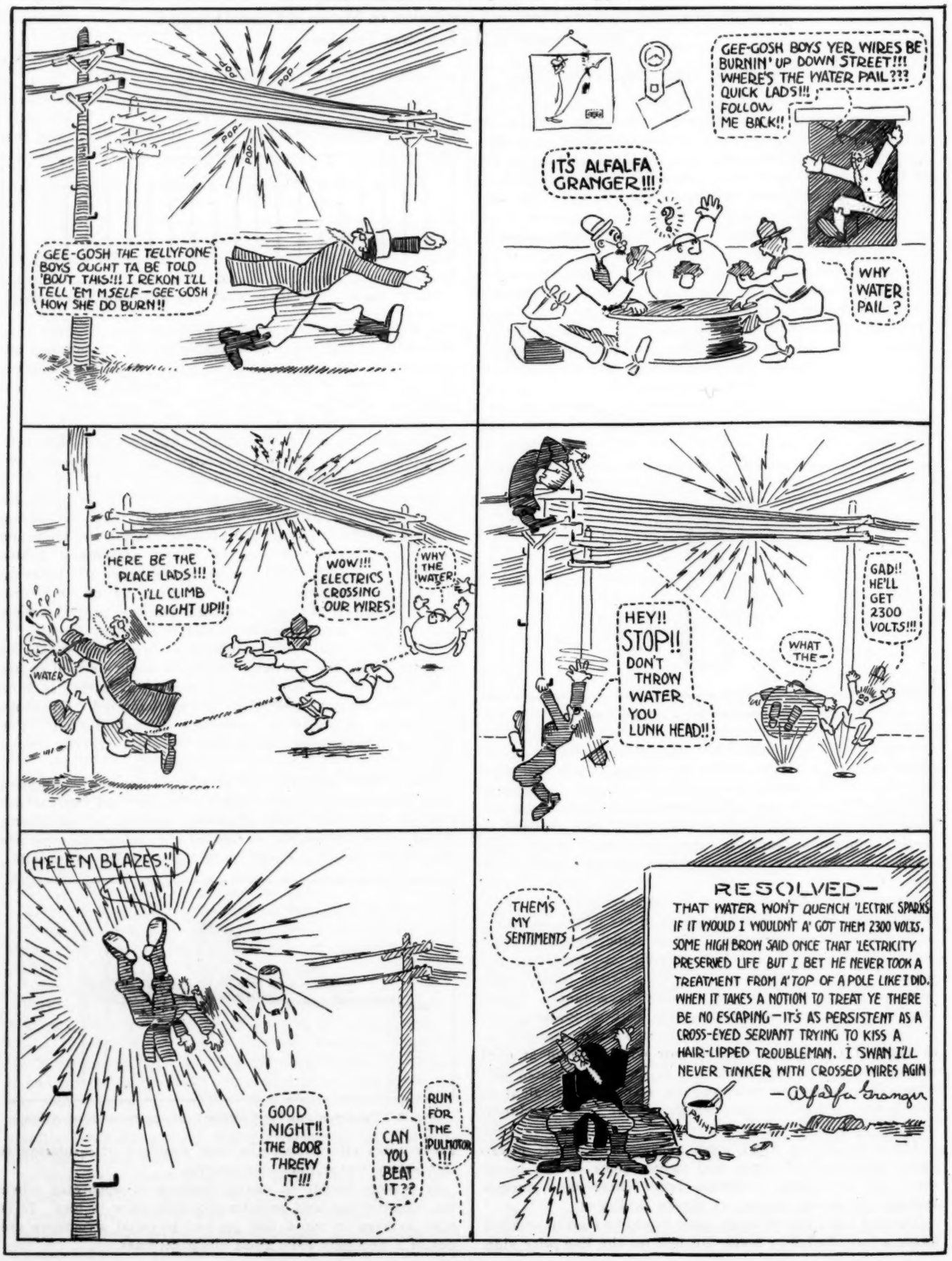
Fig. 3. Opportunities for Surface Leakage from Drop Wires.

every extra effort toward a high standard of insulation is this safety factor plus your efforts.

It is very unfair to charge failures to apparatus when the construction and maintenance efficiency is low. It is well to keep in mind that perfect physcial structures are not of a necessity even good electrical ones.

Alfalfa Granger Says Gee—Gosh ! !

Words and Music by W. L. Capple


POP
POP
POP
POP
GEE-GOSH THE TELLYFONE BOYS OUGHT TA BE TOLD 'BOUT THIS!!! I REKON I'LL TELL 'EM MSELF—GEE-GOSH HOW SHE DO BURN!!
GEE-GOSH BOYS YER WIRES BE BURNIN' UP DOWN STREET!!! WHERE'S THE WATER PAIL??? QUICK LADS!!! FOLLOW ME BACK!!
IT'S ALFALFA GRANGER!!!
WHY WATER PAIL?
HERE BE THE PLACE LADS!!! I'LL CLIMB RIGHT UP!!
WOW!!! ELECTRICS CROSSING OUR WIRES
WHY THE WATER
WATER
HEY!! STOP!! DON'T THROW WATER YOU LUNK HEAD!!
GAD!! HE'LL GET 2300 VOLTS!!!
WHAT THE—
HELEN BLAZES!!
GOOD NIGHT!! THE BOOB THREW IT!!!
CAN YOU BEAT IT??
RUN FOR THE PULMOTOR !!!
THEM'S MY SENTIMENTS
RESOLVED—
THAT WATER WON'T QUENCH 'LECTRIC SPARKS IF IT WOULD I WOULDN'T A' GOT THEM 2300 VOLTS. SOME HIGH BROW SAID ONCE THAT 'LECTRICITY PRESERVED LIFE BUT I BET HE NEVER TOOK A TREATMENT FROM A' TOP OF A POLE LIKE I DID. WHEN IT TAKES A NOTION TO TREAT YE THERE BE NO ESCAPING—IT'S AS PERSISTENT AS A CROSS-EYED SERVANT TRYING TO KISS A HAIR-LIPPED TROUBLEMAN. I SWAN I'LL NEVER TINKER WITH CROSSED WIRES AGIN
—Alfalfa Granger
PAINT

Uniform Accounting System of Interstate Commission

Complete Details of Plan Promulgated by Government Body for Use of Every Telephone Company Having Annual Income of Upwards of $50,000—Plan for Smaller Concerns is Now Under Contemplation—System Effective Universally January 1, 1913

14. **Fixed capital withdrawn or retired.**—(*a*) When any tangible fixed capital acquired prior to January 1, 1913, is withdrawn or retired from service for any cause, the amount at which it stands charged should be credited to the subaccount under account No. 100, "Fixed Capital Installed Prior to January 1, 1913," in which it is charged, and such amount, plus the expenses incident to the retirement, less the value of salvage, should be charged (1) to account No. 102, "Reserve for Accrued Depreciation—Cr." for the proportion applicable to the period covered by the reserve, and (2) to account No. 413, "Realized Depreciation not Covered by Reserves" for the remainder. Such portion only of the realized depreciation shall be charged to account No. 102, as is due to life in service during the period for which the reserve was established; this portion may be estimated on the basis of the proportion which the life in service of the property in question after that date bears to its entire life in service.

The entry of the credit to the fixed capital account should cite by name and page of book or other record the original entry, that fact should be stated in connection with the credit entry, and the actual amount originally charged should be credited. If such amount is not known, it should be estimated, the facts upon which the estimate is based and the name of the person by whom estimated should be shown, and the amount thus estimated to be equivalent to the original charge in respect of such thing withdrawn should be credited to the fixed capital accounts involved.

(*b*) When any tangible fixed capital acquired subsequent to December 31, 1912, is withdrawn or retired from service for any cause the amount at which it stands charged should be credited to the fixed capital account in which it is charged, and such amount, plus the expenses incident to the retirement, less the value of salvage, should be charged to account No. 102, "Reserve for Accrued Depreciation —Cr."

The entry of the credit to the fixed capital account should cite by name and page of book or other record the original entry of cost of the thing withdrawn.

(*c*) If the age of tangible fixed capital withdrawn or retired from service can not be determined for classification between account No. 100, "Fixed Capital Installed Prior to January 1, 1913," and account No. 101, "Fixed Capital Installed Since December 31, 1912," the property so retired should be treated as having been charged to the former account, and the necessary credits should be made to the subaccounts thereunder.

(*d*) When any fixed capital is withdrawn or retired whose book value as carried in the fixed capital accounts has been reduced by writing off estimated depreciation, only that part of the realized depreciation which has not already been written off should be charged to account No. 102, "Reserve for Accrued Depreciation—Cr.," or to account No. 413, "Realized Depreciation not Covered by Reserves."

(*e*) When any fixed capital is withdrawn or retired whose book value is greater than the known or estimated cost, such excess should be charged to account No. 417, "Other Deductions from Surplus," and the realized depreciation should be charged as elsewhere directed.

(*f*) If any fixed capital is sold for more than its original cost, the amount of depreciation, if any, accrued and credited to a reserve in respect thereof, should be determined as accurately as possible and charged to such reserve. The sum of the amount so charged and the excess of the selling price over the cost of the property should be credited to account No. 401, "Miscellaneous Additions to Surplus."

TEXT EXPLANATORY OF FIXED CAPITAL ACCOUNTS.

100. Fixed Capital Installed Prior to January 1, 1913.—This account is a summary of those accounts which include the fixed capital of the company installed prior to January 1, 1913, and which is still in service at the date of the balance sheet.

The accounts representing the fixed capital of the company as carried on its books at the close of December 31, 1912, should be so designated upon the books of the company as to show clearly that they relate only to fixed capital installed prior to the close of that date. No debits should be made to such accounts with respect to any property subsequently acquired, but the cost of such property should be charged to the accounts hereinafter provided. (See sec. 9, and note under account No. 101.)

Note.—In the reports to the Commission a statement will be required showing the names of the accounts for fixed capital actually carried by the company on December 31, 1912, and the balances therein at the date of the report.

101. Fixed Capital Installed Since December 31, 1912.—This account is a summary of accounts Nos. 200 to 274, inclusive, which include the cost of fixed capital installed since December 31, 1912. The sum of the balances in accounts Nos. 200 to 274, inclusive, as provided hereinafter, should be shown on the balance-sheet statement under this account. (See sec. 9.)

Note.—If the accounts of a telephone company have been kept as prescribed by a state commission and it is possible to close the fixed capital accounts substantially into the primary fixed capital accounts prescribed hereinafter, it will not be necessary to separate the fixed capital accounts as of January 1, 1913, but the primary accounts under account No. 101 may include the fixed capital accounts since the effective date of supervision by the state commission, and the dates in the titles of accounts Nos. 100 and 101 may be changed accordingly.

200. Intangible Capital.—This account should include the cost of intangible capital, as provided for in the following subaccounts:

201. *Organization.*—This account should include all fees paid to governments for the privilege of incorporation, and all office and other expenditures incident to organizing the company or other enterprise and putting it in readiness to do business. This includes the cost of preparing and distributing prospectuses, the cost of soliciting subscriptions for stock (but not for loans nor for the purchase of bonds or other evidence of indebtedness), cash fees paid to promoters, and the actual cash value at the time of organization of securities paid to promoters for their services in organizing the enterprise; counsel fees; cost of preparing and issuing certificates of stock, and cost of procuring certificates of necessity from state authorities, and other like costs.

202. *Franchises.* — This account should include the

amount (exclusive of any tax or annual charge) actually paid to governments as the consideration for the grant of such franchise or right as is necessary to the conduct of the company's telephone operations. If any such franchise is acquired by assignment, the charge to this account in respect thereof should not exceed the amount actually paid therefor by the company to its assignor, nor should it exceed the amount actually paid the government. Any excess of the amount actually paid by the company over the amount paid by the original grantee to the grantor of the franchise should be charged to account No. 204, "Other Intangible Capital." If any such franchise has a life of not more than one year after the date when it is first exercised by the company, it should not be charged to this account, but to the appropriate accounts in operating expenses, or in account No. 128, "Prepayments," if extending beyond the fiscal year.

Note.—Annual or more frequent payments in respect of franchises must not be charged to this account, but to the appropriate tax or operating expense account.

203. *Patent Rights.*—This account should include the cost of all rights (having a life of more than one year from the date when placed in service) acquired by the company in or under valid patents granted by the United States to inventors for inventions and discoveries in connection with the conduct of the company's telephone operations.

204. *Other Intangible Capital.*—This account should include the cost of all other property coming within the definition of intangible capital and devoted to telephone operations. Entries of charges to this account should describe the acquired property with sufficient particularity clearly to identify it, and should also show specifically the principal from whom acquired and all agents representing such principal in the transaction; also the term of life of such property, estimated if not known, and, if estimated, the facts upon which the estimate is based. (See sec. 13.)

207. Right of Way.—This account should include the cost of all land and interests in land acquired for the location of telephone wires, cables, pole lines, and conduits; salaries and expenses of right-of-way agents; expenses of appraisals and of juries, commissioners, or arbitrators in condemnation cases; real-estate brokers' commissions; cost of plats, abstracts, notarial fees, examination of title, recording deeds, etc.

This account should also include the first cost of acquiring leaseholds of land for right of way, the terms of which are more than one year each, whether acquired through direct lease, assignment, or otherwise (but not including the rents paid periodically in consideration of rights obtained under such leases). If any such leasehold is acquired by assignment, the charge to this account must not exceed the amount actually paid therefor by the accounting company to the assignor.

210. Land and Buildings.—This account should include the cost of land and buildings as provided for in the following subaccounts:

211. *Land.*—This account should include the cost of all land and interests in land, other than right of way, acquired for use in the operation of the telephone plant, such as land occupied by general and central offices, shops, stables, garages, storehouses, etc. It includes the cost of examination and registration of title, conveyancer's and notary's fees, purchasing agent's commissions or proportion of purchasing agent's salary, taxes accrued to date of transfer of title, and all liens upon the title, when such costs are assumed or paid by the purchaser in his own behalf; cost of assessments for public improvements which add to the value of the lands but which are not the property of the accounting company; cost of grading land when not done in connection with buildings; and costs of obtaining consents and payments for abutting damages and expenses of condemnation proceedings.

This account should also include the first cost of acquiring leaseholds of land, other than for right of way, the terms of which are more than one year each, whether acquired through direct lease, assignment, or otherwise (but not including the rents paid periodically in consideration of rights obtained under such leases). If any such leasehold is acquired by assignment, the charge to this account must not exceed the amount actually paid therefor by the accounting company to the assignor.

Note.—Cost of buildings and other improvements (except as specified above) should not be included in this subaccount. If at the time of acquisition of an interest in land such interest extends to buildings or other improvements thereon, which improvements are devoted by the company to telephone operations, and if the price of such improvements is not determined by the contract, the buildings or improvements should be appraised at their fair cash value for use in such operations, and such appraised value shall be charged to account No. 212, "Buildings." If such improvements are devoted to operations other than telephone or held as investments, the cost (or the appraised value, if the cost is not determined in the contract of acquisition) should be charged to account No. 111, "Miscellaneous Investments." If the improvements are removed or wrecked, the salvage (less the cost of removal or wreckage) should be credited to this account.

212. *Buildings.*—This account should include the cost of all buildings, such as general and central offices, shops, stables, garages, storehouses, etc., devoted to the general purposes of the company; also of all permanent fixtures, such as water, steam, and gas pipes and fixtures; electric wiring and fixtures for lighting, signaling, etc.; elevators and the engines and motors specially provided for operating them; furnaces, boilers, and other apparatus provided for producing steam for such engines and for heating; electric generators specially provided for producing current for lighting such buildings, etc. This account includes such piers and other foundations for machinery and apparatus as are designed to be as permanent as the buildings in (or in connection with) which they are constructed, and to outlast the first machinery or apparatus mounted thereon. It also includes the cost of real-estate brokers' commissions, examinations and registrations of titles, and other expenses, such as architects' fees, supervision, etc., incident to the construction or purchase of buildings; and the cost of grading and of sidewalks, fences, hedges, etc., on grounds used in connection with such buildings. It does not include any telephone equipment, wiring, or apparatus for generating or controlling electricity for operation of the telephone system.

220. Central Office Equipment.—This account should include the cost of all central office equipment, as follows.

221. *Central Office Telephone Equipment.*—This account should include the cost of local and toll switchboards, chief operators', monitors', and supervisors' desks and tables, wire chiefs' testing outfits, main and intermediate frames, cables, and jumper wires, call registers or meters, relay racks and coil racks and power plants including rectifiers generators, engines, motors, batteries, power switchboards, meters, and fuse boards; telephone and telegraph instruments, and other electrical instruments and apparatus in the central office devoted to the operation of the telephone plant.

222. *Other Equipment of Central Offices.*—This account should include the cost of furniture and equipment (other

(*Continued on page* 53.)

The Telephone Inspector and the Troubleman

Continuation of a Series of Articles Begun in the September 7 Issue of Telephony—They Deal in an Elementary and Explicit Manner With Many of the Problems Encountered by Telephone Men in the Operation of Small Exchanges

By A. E. Dobbs

"Here is still another plan of connections sometimes used in farmer line connections which is a very great convenience to exchange operators. As you know, when the ordinary telephones are used, every ring over the farm lines goes through the drop and sometimes keeps the operator guessing whether or not the call is meant for her.

"In this diagram (Fig. 47) the drop is connected to one side of line and the other end of its winding is grounded. In this way, as you see, the ruralites can ring each other to their heart's content without throwing the drop at the exchange. If, however, they wish to ring the exchange, they simply push the button. It grounds the side of the line the drop is on and thus the exchange can be signaled without ringing anyone else. See the point?"

"Very easy to understand from that," replied Will. "By the way, you promised to explain how it is that any one of four parties can be rung without ringing anyone else than the party wanted."

"So I did," responded George, picking up a ringer. "This ringer is wound just like any other magnet coil, but it is

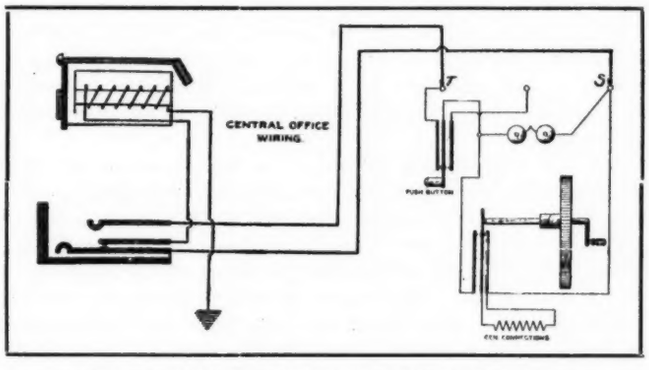


Fig. 47. Bridging Set Circuit with Push Button.

surmounted by a permanent magnet which tends to give it a different set from the ordinary coil. Instead of one magnet being a north and the other a south pole at the upper ends, we will have, say both of the upper ends to north, by the permanent magnet and the opposite ends south. Now, in the ordinary ringer when current flows in the winding of the coil, the armature is pulled to the side corresponding to that of the permanent magnet, the armature, being polarized, is drawn to one pole and is repelled from the other. When the current is reversed, it is drawn to the opposite side and repelled from the first.

"Let us now suppose," continued George, making a sketch (Fig. 48-A), "that we hold the magnet down on one side by means of a spring, say the positive side, and send a series of positive impulses over the line. It is plain that the bell will not respond because the clapper is already held to that side by the spring. If however, we reverse the direction of flow of the current, that is, send negative impulses only over the line, the clapper will be pulled to the opposite side and as soon as the current ceases, the spring will pull it back again, thus making two strokes for one impulse of current. If we put two or these bells on a grounded line, like this (Fig. 48-*B*) and place one spring on the positive side and the other on the negative of the ringers, we will have one bell that will respond only to negative and another that will respond only to positive impulses. It is easy to so arrange the commutator of the generator that we can have selective ringing to this extent.

"With a metallic circuit line, the generator is grounded.

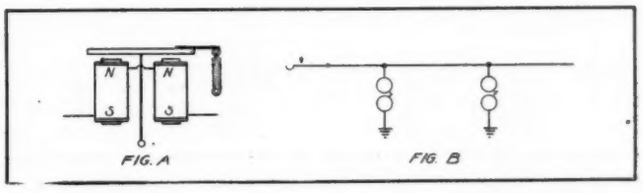


Fig. 48. Biased Bell and Circuit for Party Line Ringing.

For ringing, both sides of the line are grounded, thus making, practically, two grounded lines. As they are usually grounded through very high resistance, 2,500-ohm ringers and sometimes an extra resistance, the leakage to ground is not sufficient to interfere with the talking service, which of course is over the two lines as a metallic circuit.

"Here is a diagram of a four-party line system (Fig. 49). In this case a jack is shown, the short spring of which is called the tip because it makes contact with the tip of the plug and the other the sleeve, as it connects to the plug sleeve. As the ringers are all wound the same way at the factory and the springs are set to the same side, a sort of cross connecting device is placed at the back of the box. By it, with the aid of flexible conductors, we can change the direction of current flow and hence change an instrument from one station to another, if it is desired, without making any change in the instrument itself. Consider the left coil as the minus or negative and the right coil as the positive side of the ringer.

"Stations Nos. 1 and 3 are connected for ringing from the tip side of the line and stations Nos. 2 and 4 are arranged for ringing from the sleeve side. If positive pulsating current is

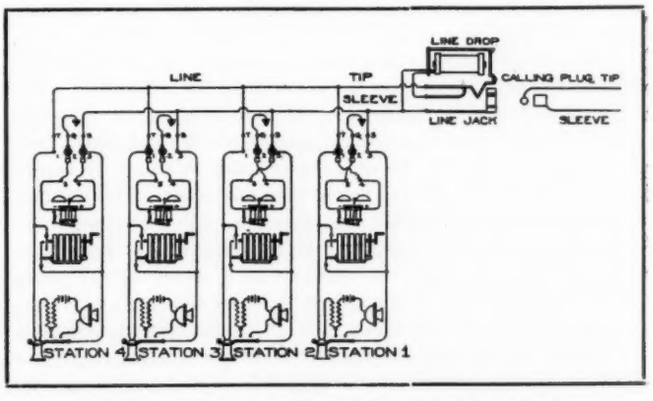


Fig. 49. Circuit for Selective Party Line Ringing.

sent over the tip side of the line, it will pass through the ringer of Station No. 1 to ground and ring the bell as each impulse will pull the armature over to the positive side and the biasing spring will draw it back between the impulses. The current also passes through the ringer of Station No. 3, but it is in

such a direction as to be neutralized, or rather its effect is counteracted by the biasing spring. If the direction of the current is reversed, so that it flows from the ground through the ringers and to the exchange over the tip side of the line, the ringer at Station No. 3 will be operated and that at

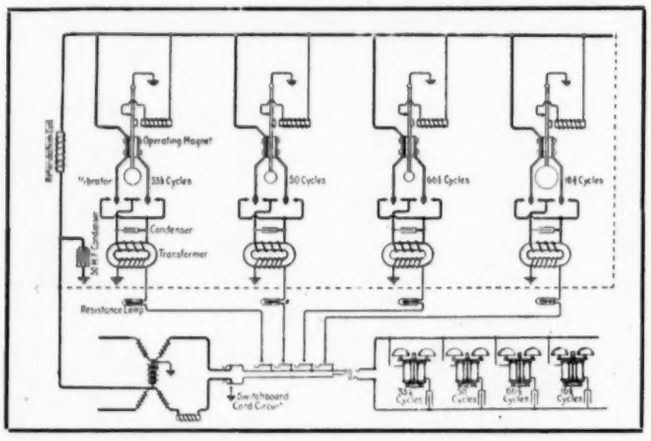


Fig. 50. Simplified diagram of Harmonic Ringing System.

Station No. 1 will not be affected. Thus either Station No. 1 or Station No. 3, connected to the tip side, may be rung at will by the application of either positive or negative pulsating current. The same holds true of Stations No. 4 and 2 on the sleeve side of the line.

"The manufacturer generally supplies a wiring diagram showing the ringer connections for each station so that the sets may be used at any station by making the necessary changes at the ringer terminals."

"What kind of a drop is used on the switchboard for the selective lines?" queried Will. "I shouldn't think the regular drop would work very well."

"It doesn't," responded George, "as, when a party calls the exchange, enough current may pass through the other ringers on the line and cause them to operate. To avoid any possibility of false calls being made in this manner, a low wound drop is used on the selective lines, shunting enough current as to prevent the ringers from operating."

"While you are on the subject of selective ringing," spoke up Will, "I should like to have you tell me something about the harmonic system."

"In harmonic selective ringing systems," answered George, "the ringers are weighted so that their armatures will respond only to currents of different frequencies. With this kind of ringing as many as eight parties may be called selectively. Here is a sketch (Fig. 50), which I copied from a Western Electric bulletin, that shows the idea very clearly. The apparatus within the dotted lines is known as the converter outfit. It consists of from vibrators or pole changers which send direct current from the battery through the primary winding of transformers first in one direction and then the other. This change in direction of the current flow produces an alternating current in the secondary winding of the transformer, the frequency of which depends upon the rapidity with which the vibrator reverses the direction of current flow in the primary.

"Each vibrator, as you can see from the lettering, is adjusted to produce alternating current of a certain frequency in the secondary of the transformer. One bell of each set of instruments on a line is adjusted to respond to but one frequency. Hence any bell on the line may be rung by use of the proper frequency and none of the others disturbed.

"It is claimed that the system operates satisfactorily on either grounded, common return or full metallic lines. Two-, four-, or eight-party ringing may be used, the later being obtained by connecting four instruments from each side of the line to ground.

"In case of a large exchange, the ringing currents may be obtained from a multi-cycle motor generator operated by current from the supply mains of the local electric company."

"I should think," remarked Will, "that the harmonic system would permit the use of simpler ringing keys than used with the other selective systems."

"It does," replied George, "and that is one of its advantages as the maintenance charges are lower and there is less key trouble. Then the two-and four-party lines are all metallic so there is no trouble in ringing due to poor ground connection and also no inductive disturbances on the line caused by the ground connection or earth currents. Another advantage is that the capacity or resistance of the line has no effect on the operation of the ringer.

"There are also lockout systems which are used on party lines. They use switches operated by a clockwork mechanism that will lock all the other telephones out but the one in use. This can be applied up to 20 or 30 instruments on a line. It would require an extended description to explain and, anyway, you would have to see the instruments to understand it so we will have to let it go."

(To be continued.)

Service Association Growing Rapidly.

Frank L. Eldridge, assistant secretary and field manager for the Central States Telephone Service Association, who has been on the road for the past three weeks on behalf of the organization, reports to TELEPHONY that the membership now aggregates well over 200,000 units, and that new members are signing up rapidly.

Mr. Eldridge states that the general plan of the association appeals strongly to the average telephone manager, who sees in it, and rightly, a most unusual opportunity to better his plant and operating conditions through co-operation with the Service body.

Although a great deal of ground is being covered by Mr. Eldridge in his travels, and he is making exceptional progress, there are scores of operators whom he will be unable to meet personally for some time. These are urged to write him at his Chicago office for full information, including copies of the by-laws for signature. His address is 162 W. Monroe street.

"The operating rules which the association has formulated for the use of its members," says Mr. Eldridge, "are so framed that they may be immediately adopted by any company and put into use. They are perfectly simple and require no expert to adapt them to any system, large or small. The company which is using them will be in position later to readily inaugurate such changes as may be deemed advisable by the association, from time to time."

Dr. Doty Medical Director Under Bell Pension Plan.

Alvah H. Doty, former health officer of New York, has been appointed medical director of the employes' benefit fund committee, of the American Telephone & Telegraph Co., the Western Union Telegraph Co., and the Western Electric Co., in connection with the pension and sick-benefit plan.

It is proposed to establish a system of medical supervision and sanitation. Employes found to be suffering from communicable diseases, such as tuberculosis, will be removed for treatment and care. Proper lighting, good ventilation, sanitary plumbing, pure water and other hygienic elements of workrooms will come within the purview of this branch of the work.

Fremont, Ohio, Company Increases Capital.

The stockholders of the Fremont (Ohio) Home Telephone Co. have approved the increase in the capital stock of the company from $125,000 to $200,000 as a move in the company's plans to take over the Fremont plant of the Central Union Telephone Co.

INTERSTATE COMMERCE ACCOUNTING PLAN.

(*Continued from page 48.*)

than telephone equipment) in central offices for the operating forces. This account includes the furniture and equipment in operators' rest and lunch rooms, and in operators' schools.

230. STATION EQUIPMENT.—This account should include the cost of all telephone terminal equipment installed in service, either for subscribers or for company use, including the cost of installation, as follows:

231. *Station Apparatus.*—This account should include the cost of station apparatus, such as telephone sets, intercommunicating sets, bells, backboards, desk stands, coin boxes, protectors, battery boxes, initial batteries and cords, special station switching devices not otherwise classified, and telephone and telegraph instruments or parts thereof when owned by the company and installed for service.

232. *Station Installations.*—This account should include the cost of installing station apparatus and the cost of inside wires; that is, the wires (or cables) from the instruments to the point of entrance to the building, where the drop wires or interior block wires terminate, or to the junction boxes, where the house cable or other cable terminates, including wires on the same premises to connect main and extension stations, or to connect the private branch exchange distributing frames with their terminal stations.

233. *Interior Block Wires.*—This account should include the cost of interior block wires (or cables) from the point of entrance to the building, where connection is made with the inside wires, to the point of connection with the permanent circuits at the terminals (block cable boxes) of the subsidiary underground cable or subsidiary aerial cable.

234. *Private Branch Exchanges.*—This account should include the cost of private branch exchange switchboards, their distributing frames, the cables connecting such switchboards and distributing frames, and the cost of installation.

235. *Booths and Special Fittings.*—This account should include the cost of booths and special fittings, such as desks, chairs, fans, and cash registers, and the cost of installation.

241. EXCHANGE POLE LINES.[1]—This account should include the cost of poles, towers, cross arms, pins, brackets, braces, guy wire, guy stubs, and other materials used in the construction of exchange service pole lines; also the cost of first clearing right of way.

242. EXCHANGE AERIAL CABLE.[1]—This account should include the cost of cables devoted to exchange service including the cost of suspension wire, cable clips and rings, cable boxes and fittings, pole seats and platforms, loading coils, pot heads, protectors, sleeves, and other material used in hanging such cables.

243. EXCHANGE AERIAL WIRE.[1]—This account should include the cost of exchange service wires, including insulators, sleeves, and other materials used in attaching such wires to insulators. The exchange wire includes the drop wire leading from the overhead plant to the point of entrance to the building.

244. EXCHANGE UNDERGROUND CONDUITS.[1]—This account should include the cost of exchange service conduits, including the cost of pipe, cement, manholes, manhole furnishings, and other materials used, the cost of connections to poles and buildings, repaving, and other costs incident to the installation of such conduits.

[1]If plant is used both for exchange and toll service, the principal use of such plant should determine its classification.

245. EXCHANGE UNDERGROUND CABLE.[1]—This account should include the cost of exchange service underground cables, including cable boxes and fittings, loading coils, and other materials used in the work of installing such cables, and other cost incident thereto.

This account should include, in addition to the main exchange underground cable, the subsidiary cables through laterals to pole or building terminals; the subsidiary cables to the interior of city blocks for connection with interior block wires; and the subsidiary cables entering vertically (as house cables) into buildings for connection there with inside wires.

Note.—House cables are considered to be vertical extensions of underground cables or plant similar thereto. They do not include the inside wires extending from terminal boxes of house cables to subscribers' stations, nor the cables for subscribers' private branch exchange switchboards which are included in account No. 232, "Station Installations."

246. EXCHANGE SUBMARINE CABLE.[1]—This account should include the cost of exchange submarine cable, cable towers, loading coils, cable boxes and fittings, and other materials used in the installation of such cables, and other costs incident thereto.

251. TOLL POLE LINES.[1]—This account should include the cost of poles, towers, cross arms, pins, brackets, braces, guy wire, guy stubs, and other materials used in the construction of toll-service pole lines; also the cost of first clearing right of way.

252. TOLL AERIAL CABLE.[1]—This account should include the cost of cables devoted to toll service, including the cost of suspension wire, cable clips and rings, cable boxes and protectors, sleeves, and other materials used in hanging such cables.

253. TOLL AERIAL WIRE.[1]—This account should include fittings, pole seats and platforms, loading coils, pot heads, the cost of toll-service wires, including insulators, sleeves, and other materials used in attaching such wires to the insulators.

254. TOLL UNDERGROUND CONDUIT.[1]—This account should include the cost of toll-service conduits, including the cost of pipe, cement, manholes, manhole furnishings and other materials used, the cost of connections to poles and buildings, repaving, and other costs incident to the installation of such conduits.

255. TOLL UNDERGROUND CABLE.—This account should include the cost of toll-service underground cables, including cable boxes and fittings, loading coils, and other materials used in the work of installing such cables and other costs incident thereto.

256. TOLL SUBMARINE CABLE.—This account should include the cost of toll submarine cable, cable towers, loading coils, cable boxes and fittings, and other materials used in the installation of such cables, and other costs incident thereto.

(*To be continued.*)

Heart Trouble Diagnosis by Telephone.

Long distance heart examinations can now be made by physicians at Johns Hopkins hospital by the use of the cardiograph or heart recording instrument, is the announcement sent out at Baltimore.

"It is true that we can record the condition of a patient 500 miles from the hospital," said one of the executive physicians recently. "The telephone has made it possible. It is true that the expense for such an examination would be great, although expense is not considered by some men who are ill."

A specialist, even though he be hundreds of miles from the patient, after examining the heart via telephone, could advise the physicians in attendance what steps to take.

From Factory and Salesroom

Conventions: National Assn., Chicago, February 18, 19, 20; Wisconsin Assn., Madison, February 12, 13

Something More About Business Education.

In a recent issue this paper called attention to the admirable course in accounts, finance and management offered by the Alexander Hamilton Institute, of New York City. The numerous letters TELEPHONY has received from its subscribers, asking for a frank and impartial opinion of this course and service, indicate that many of its readers believe business, like law and medicine, is rooted in science, and that they have a very keen interest in the study of this science.

The review was directed more particularly to the text on which the course and service is based. A careful examination of the various additional features that go to make up the Institute course and service may well lead one to the conclusion that the Alexander Hamilton Institute has, as it claims to have, the most comprehensive and thoroughly satisfactory method of giving big, broad business training of a University grade that has ever been made available to the busy business men of America.

The Institute course is declared to be far more than a collection of valuable literature; it is a systematic, carefully organized whole, in which each volume, each pamphlet, each letter, each criticism or suggestion, has its own well defined purpose. The course is of particular interest to those who wish to acquire a scientific and thoroughly practical knowledge of business—the kind that fits young men for executive positions, and gives executives new viewpoints in their own and related fields.

Among those who have prepared special lectures for the course are such prominent men as Harrington Emerson, the efficiency engineer; William Wilson Finley, president of the Southern Railway Co.; Louis J. Horowitz, president of the Thompson-Starrett Co.; Charles H. Huttig, president of the Third National Bank, St. Louis; L. A. Larson, assistant to the vice-president of the American Locomotive Co.; E. St. Elmo Lewis, advertising manager of Burroughs Adding Machine Co., and a long list of equally well known business executives.

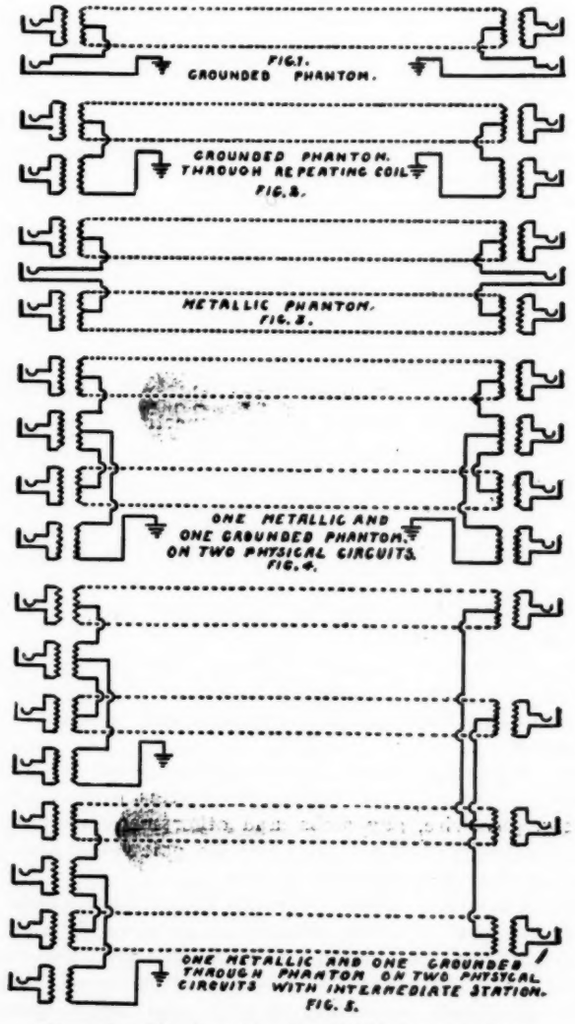
One of the most intensely interesting lectures is "Scientific Management," prepared by L. A. Larson. In this lecture of about 50 pages, Mr. Larson has considered the principles of scientific management, reviewed its accomplishments and failures, and added his own opinions as to its limitations and possibilities. Recent investigations along the line of business efficiency make this timely topic of especial interest to telephone men.

The fact that Mr. Larson successfully worked out and applied many scientific economies for the Chicago Great Western Railway, and also for the Northern Pacific Railway, makes him an authoritative and interesting writer on this subject. Moreover, the principles of efficiency improvements, as he describes them, are so lucidly set forth that many adaptations of these principles would quickly suggest themselves to any one interested in improving telephone company organization.

The secretary of the Alexander Hamilton Institute will send a copy of Mr. Larson's lecture, "Scientific Management," to any reader of TELEPHONY who will write for it. Address your request to William H. Lough, secretary, 13 Astor Place, New York City.

The New Century Phantom Repeating Coil.

The Century No. 81 phantom repeating coil of the Century Telephone Construction Co., of Buffalo, N. Y., is of the type commonly known as the "ring core type." That is, the magnetic field is complete and endless, thus giving the minimum amount of magnetic loss. The core is made up of a small gauge of specially soft drawn iron wire, which retains practically no magnetism, and allows a rapid change of polarity under the influence of alternating current. The construction of the core is said to be one of the principal features that go to make up the unusual high efficiency of the coil. The copper windings are placed on spools of high insulating material and are divided equally along the circumference of the "ring core," in this manner utilizing every possible portion of the iron.



Plans for Phantom Circuits, Using Century Coil.

"Ring core" coils have heretofore been made with a large air gap between the separate turns of the copper windings. The elimination of this air gap is another feature aiding high efficiency. The winding of the spools is accomplished by means of special machines, which place the several wires on simultaneously, bring all wire in a similar position in relation to the core and making an exact phantom balance possible. By placing the winding in parallel static induction, a factor heretofore unused, is taken advantage of, while all other coils are said to depend upon a magnetic induction only. The wire used is the greatest gauge that will allow the greatest number

of turns for the smallest amount of resistance. The total resistance of the coils is 88 ohms, giving a resistance to the phantom of only 22 ohms.

After the coil is wound complete it is treated to exclude all air and mosture and is filled with a solution to maintain this high dielectric. The exclusion of all air reduces the possibility of a burn-out from the high tension current to a minimum. After being thus treated the coil is placed in an iron case and entirely immersed in a moisture proof solution; the cover is then set in place, which completes a shield for the exclusion of all foreign magnetic effects. The weight of the coil complete is 13 pounds and measures at base, 9⅜ in. long, 4⅝ in. wide and 3⅛ in. high.

Several plans for building phantom circuits, using this coil, are shown herewith. Fig. 1 shows a grounded return phantom, which is the most economical to equip, as it requires only two coils. The phantom is brought in as a regular line to the switchboard, but must be considered as a grounded line and connection to a metallic line should be made through a cord circuit repeating coil. No transpositions are necessary in a grounded return phantom.

Fig. 2 is practically the same circuit as Fig. 1, except that it is brought to the jack through a repeating coil and is treated as a metallic line. Both coils should be of the ring through type.

In Fig. 3, a metallic phantom is shown on two physical circuits. This circuit is in most common use and, when the pairs are in true balance, is not only practical, but has an advantage over physical circuits in that it has but one-half the line resistance.

Fig. 4 is the same circuit with an additional grounded phantom, thus providing for two phantoms on two physical circuits. The grounded phantom is used by some operating companies as a telegraph circuit and works perfectly for this purpose. In this case the additional coils are not required.

Fig. 5 shows a through grounded and metallic circuit on two local lines, each way from an intermediate station. This makes an ideal condition, as the long distance messages are carried over the low-resistance phantom, while the physical lines are used between nearby stations. These loops may be built up indefinitely.

The Century company's engineers will be glad to give, without cost, detailed instructions on how to work phantoms to the best advantage, and also furnish the necessary diagrams of the circuits. Write the Century company, telling it as fully as possible the details of the circuits you have, and complete information will be given you.

Motor Trucks on Way to Chicago Show.

About 200 of the new and improved models of motor trucks and delivery wagons that were just exhibited at the New York automobile show by fifty-one manufacturers, were brought west this week and last to be displayed in Chicago. Besides these, 25 other manufacturers who did not take part in the eastern show are rushing work at their factories on nearly 100 other models to be shown for the first time in the western metropolis during the second week of the Chicago show, from February 10 to 15.

As usual, the display in the Coliseum and First Regiment Armory will be larger and more varied than the one just closed in Grand Central Palace and Madison Square Garden in New York City. More than 75 makers will expose nearly 300 types and models of the most up-to-date commercial and municipal vehicles, ranging from power delivery wagons of 500 pounds capacity, listing at $500, to 10-ton trucks and special motor fire engines costing upwards of $7,500.

Newspaper men and others who have been in attendance at the eastern exhibition are enthusiastic over the remarkable showing made by the industry and predict that the coming display in Chicago will be a revelation to the public. Great forward strides in design and construction have been made by the commercial vehicle builders as a whole, and the range of application of the power vehicle has been extended into many new and unique fields. Several makes and styles of tractors, both gasoline and electric, will be shown, with trailer bodies attached, some with a capacity up to 10 tons.

All records of attendance at a truck show are almost certain to be broken. Many more persons attended the New York show this year than the winter before, and the management of the Chicago show has been receiving many letters from all parts of the central and western states announcing that the writers intended visiting the display and were considering the purchase of motor trucks and delivery wagons. Some specified the kind and number they expect to buy. Among these are a number of letters from fire chiefs and other city officials, reporting that the authorities were in the market for fire apparatus and that large appropriations were about to be made for its purchase.

There is, in fact, every indication that many sales will be made during the show and shortly afterward as a direct result

Speedwell 4-ton Truck in Construction Work.

of it. This promises to be a phenomenal year in the motor truck industry, and it is freely predicted that production and sales will double last year's.

Of the exhibitors of complete wagons and trucks who have contracted for space, no less than 33 are specializing in vehicles of 750 to 3,000 lbs. capacity. Delivery wagons of from 500 lbs. to 1,000 lbs. capacity, in both gasoline and electric types, will be shown. Prices of these range from $500 to $1,800 for the smallest up to $700 to $2,500 for the 1,000-lb. wagons.

Seventeen of the exhibitors produce wagons and light trucks of 1,500 pounds capacity, costing from $750 to $2,100. Twenty-five manufacture one-ton trucks listing at from $1,100 to $2,870 for the chassis without body. Twenty-seven make trucks of two tons and 2½ tons capacity, with prices ranging from $1,800 to $3,100.

Paragraphs.

McRoy Clay Works, Chicago, continues its monthly calendar desk blotters of the up an onward type. The February blotter bears this message regarding stick-to-it-iveness, "Another reason for sticking as long as you can, is that there's always a chance to win by a lucky punch."

The Simplex Electrical Co., Boston, has changed its name to the Simplex Wire & Cable Co. No change of management or interest is involved in this change of name.

Features Federal Trucks.

Recently a banquet was tendered the employes of a very progressive draying company of San Francisco. It is the custom of this concern, the Emmons Draying & Safe Moving Co., to give its employes one grand "feed" annually. Some of their most sturdy workers, being inanimate, were not included among the guests but due consideration was given them on the menu card. Several delicacies in the pastry line were styled after these inanimate "pluggers" namely, Federal motor trucks, four in number, which have helped so much in the last two years toward making the Emmons Draying & Safe Moving Co. one of the largest and most up-to-date concerns of its kind in Frisco.

The supper was followed by toasts and talks on subjects that appealed to the teamsters and chauffeurs such as "Our Teamsters," "Our Horses," "Comrades," "Our Bosses," "Auto Trucks," etc. By this novel scheme this company gets the co-operation of its employes who all work together for the general welfare of the company.

Federal Truck Figures on Menu of Draying Firm's Dinner to Employes.

THE DUPLEX METALS CO., Chester, Pa., is mailing a folder to the trade bearing the significant caption, "This Road Doesn't Use Copper Clad." Inside there is a cartoon showing the "Ark" railroad, with our old friend, Noah, at the throttle of the rickety engine, Shem, Ham and Japhet playing pinochle on a "flat" just behind, and the ark itself bringing up the rear. Below is a list of the railroads which do use Copper Clad—and it is an imposing list to consider.

THE JOHN A. ROEBLING'S SONS CO., Trenton, N. J., is distributing a handsome brochure, a reprint from Scribner's Magazine of an article, "The Sea Voyage of a Drydock," by William J. Aylward. This is an account of the transportation of the drydock Dewey from Sparrow's Point, Md., where it was built, to the Philippines. It is beautifully illustrated by the author and is a very remarkable story remarkably told. The Roebling company furnished a number of wire hawsers used in towing the dock. These were 2 in. in diameter, 1,760 ft. long and heavily galvanized to resist the action of the sea water.

THE OSHKOSH MFG. CO., Oshkosh, Wis., in order to take care of the rapidly increasing business in Indiana and Illinois, has opened a branch house at 410 to 426 South Clinton street, Chicago. The company feels that this will be a great convenience to its many Chicago friends and customers, as the new branch will carry a complete line of the well known Oshkosh tools. This house will be in charge of R. L. Thayer.

Book Review.

Opera Stories is the title of an interesting book, written and published by Henry L. Mason, 188 Bay State Road, Boston, Mass., which contains a digest of the plot and action of all the great operas. The volume will be found valuable by those who wish to know the story of an opera without reading the entire libretto. It deals with 132 operas and also contains portraits of leading singers.

Telephone Saves Man in a Vault.

While half-crazed friends ran about Ottawa, Kans., trying to discover the combination, Frank Baldwin, ex-county clerk, faced death, a prisoner in the big steel vault at the courthouse, says a dispatch from that town. Only the good memory of John Bell, county clerk eight years ago, who gave the combination over the telephone from Salina, 250 miles distant, saved Baldwin's life. Bell and Baldwin were the only persons knowing the combination, and Baldwin was unable to make his voice heard through the massive steel door. Baldwin was accidently locked in the vault by F. C. Proshaw, his successor.

Youngster Handles Long Distance Call.

Carl J. Stein, of Oak Park, Chicago, talked with his two-year-old nephew in Denver, Colo., over 1,000 miles of telephone wire recently.

The child's parents were out of the room when the telephone bell rang and Jimmy, the son of Mr. Stein's brother, answered.

Legal Cases and Decisions

By A. H. McMillan

Railroad Crossings on Public Highways.

"We have some railroad crossings on public highways and the railroad company is trying to compel us to pay $1 per year for each overhead crossing and $5 per year for each underground crossing. Our wires are all maintained at the proper height and all our underground crossings enter the ground outside the right of way. Now the question is: Can the railroad collect the rental where the lines are on public highways? That the railroads in Illinois do not own their right of way across public highways is our understanding; and that the highways are controlled by the highway commissions. We have a permit from the highway commissioners and also from the adjoining property owners to construct and operate our lines. Our lines have been up about 10 years and have been rebuilt, and until now complaint has never been made by the railroad company."

In Illinois a telephone line is not an additional burden upon the highway, except where the fee to the center of the highway is in the abutting owner. Board of Trade Telephone Co. vs. Barnett 107 Illinois, 507; 47 Atlantic Reporter, 453; 1 American Electrical Cases, 565.

If in this particular locality the fee of the land to the center of the highway is in the abutting owner, then your telephone line is an additional burden upon the highway and one which the railroad, crossing the highway, would not have to bear. If the telephone line at that point is not an additional burden, it is one that the highway would have to bear. Hence the railroad would have to suffer the crossing of the highway without any compensation.

Deliberate Contract is a Defense.

An action was brought against a telephone company and a street railway company for damages for personal injury. The defense appealed from the judgment for the person injured and among other errors, contended that the court was wrong in refusing to charge the jury that if the plaintiff received his injuries by accidentally grabbing a wire in an effort to prevent himself from falling, and missed the post in attempting to lean up against it, and such accident was the cause of the injury, he was entitled to a verdict.

The supreme court overruled the contention upon the ground that it was to guard against accidental contact with dangerous instrumentalities that safeguards are required and necessary. The court said that a deliberate contact, with full knowledge of the danger, was contributory negligence and would be a complete defense, but that this situation did not exist in the case. Walker vs. Southern Bell Telephone & Telegraph Co., 75 Southeastern, 1024.

Assignment of Party-Line Contracts.

"This company at the beginning of business made some bad mistakes with contracts for 20 years at the rate of $1 per telephone on party lines. We are enclosing a duplicate of the contracts. We would like to know if they (the second party) can sell their contract to other parties without any contract whatever and force us to give them service at the rate of $1 per year, when our regular rate per year is $2 in advance. You understand the $1 contract was discontinued shortly after the $2 contracts were started, and all that came on the system later were at the $2 rate.

We would like to know if a subscriber on a party-line who is delinquent and refuses to pay, should be called for a subscriber who pays his dues. Can we be compelled to call the non-subscriber or not? We would like to know further how to keep from 'bursting' with such contracts."

A contract is ordinarily assignable unless there are some peculiar circumstances that indicate to the contrary. Whether there are any circumstances in this case that would so indicate would be a question of fact. In other words, you would have to present to the court all the facts which exist as reasons why the making of an assignment would not have been intended at the time the contract was made. These would be circumstances connected with the maintenance and operation of the party-lines, etc. In the contract the following clause could be used as a basis for contending an assignment was not contemplated: "It is further agreed by the first party that if they (the first party) should sell or in any way transfer their system, this contract shall remain in full force unless mutually agreed upon to change the same."

There is no provision in the contract which you submit providing that the contract shall remain in force if the *second* party sell or transfer their system. The fact that provision was made for the sale by first party and not by second party, could be used as an argument to show that the sale by the second party was not to be permitted under any circumstances.

On the other question, we would say that you would not have to call any delinquent subscriber. He should be treated as if he were no longer a subscriber.

Special Rate is Not Discrimination.

A contract between a telephone company and a patron giving a special rate for its service, is not invalid for the discrimination, in the absence of statute, where the compensation provided for is within reason, as only unjust discriminations are condemned at common law. So held the Supreme Court of Wisconsin in a recent case, brought by a telephone company against a patron for telephone service.

The answer admitted receiving the service but pleaded a contract ante-dating the public utility law, to the effect that the price of such service should not exceed $10 a year. It was alleged also that the defendant was the owner of one share of common stock of the company under an agreement that he should be furnished telephone service for not exceeding a charge of $10 per year, and that such contract became a condition of the certificate of stock.

The laws of the state require every telephone company to furnish its service without discrimination. Another law provides that the furnishing by any public utility of any product or service at the rates and upon the terms and conditions provided for in any existing contract executed before April 1, 1907, shall not constitute a discrimination.

It was contended by the company that the special contract embodied in the stock certificate was a discrimination and hence it was not bound by it, and the patron could not rely up it. This the court held not to be the law as the contract was made previous to April 1, 1907, and was not of itself an unjust discrimination. Peoples Telephone Co. vs. Lewis, 133 Northwestern, 100.

Injuries to Subscriber from Power Wire.

A telephone and a power wire came in contact at Mesa City, Arizona. Neither was protected by insulation from the other. Two telephone wires ran into a dairy plant, the telephone instrument in which was not protected from an excessive current of electricity by ground wires, fuse plugs, or other approved safety devices. As a result of the contact, an excessive current of electricity on the telephone wires caused fire and sparks to fly from the telephone instrument, maintained in the boiler room, and threatened to destroy the plant.

An employe, in order to protect the plant from fire, cut the telephone wires and in so doing received the electric current into his body, causing his death. The defense was that the accident was not caused by any negligence of either the telephone or electric light company, but was caused by the act of a third person cutting a large limb from a fig tree standing on his premises in close proximity to the electric line and telephone line, near where the two lines crossed, the branch falling on the power wires and causing them to break and come in contact with the telephone wires.

The defense contended that this act was the act of an intervening human agent and was the proximate cause of the accident. This defense was overruled by the court, which held that the accident was a consequence naturally following the negligence of the two companies, which was the proximate cause of the injury, unless the act of the third person was malicious or criminal; if it was innocent, it being a matter not to be considered, and if negligent, being only a concurring cause, making both the third person and the companies liable. Crandall vs. Consolidated Telephone, Telegraph & Electric Co., 127 Pacific 994.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personals.

D. D. TURNER has resigned his position as manager of the Northfield Telephone Co., at Northfield, Minn.

O. C. WALKER has been appointed manager of the Shelbyville Telephone Exchange, at Shelbyville, Ohio.

I. W. LYLE has resigned his position as local manager of the Cumberland Telephone & Telegraph Co., at Henderson, Ky.

WALTER HINTZE has been appointed manager of the Union Telephone Co., at Prairie Du Chien, Wis., to succeed J. A. Murray, resigned.

PALMER ROLANDER, formerly of the Bureau County Independent Telephone Co., at Princeton, Ill., has been transferred to the management of the company's exchange at Wyanet.

R. E. ROBINSON, traffic chief of the Southern Bell Telephone Co., at Richmond, Va., has been transferred to Atlanta, Ga., where he will hold a similar position. John Orth, of Norfolk, will succeed him at Richmond.

J. A. WILLIAMS has resigned his position as manager of the local exchange of the Cumberland Telephone & Telegraph Co., at Culleoka, Tenn., and has accepted a position with the L. & N. Railroad. J. Tidwell will succeed Mr. Williams, at Culleoka.

F. W. ATKINS, formerly manager of the local exchange of the Central Union Telephone Co., at La Salle, Ill., has been appointed district commercial manager of the company in La Salle, Bureau, Putnam and Livingstown Counties, of this state, with headquarters at La Salle.

MARTIN ENRIGHT, who has been local manager for the Interstate Independent Telephone & Telegraph Co., at Lockport, Ill., for the past year, has accepted a responsible position in the general offices of the company at Aurora. He will be succeeded by E. L. Pensington, of Kentucky.

F. W. KELLY, who has been local manager for the Central Union Telephone Co., at Galesburg, Ill., has been made manager of the Galesburg district comprising, Knox, Warren, Henderson and Stark, and parts of Mercer and Henry counties, succeeding Thomas Brown, who has been made manager for the Kankakee, Ill., district.

P. R. MATSON has resigned his position as manager of the Fairmont Telephone Co., Fairmont, Minn., as a result of his increased private business, but has been persuaded to remain an official and to act as commercial manager, giving as much of his time as possible to the company's affairs. Fred Roepke, superintendent, has been elected manager in Mr. Matson's place.

Obituary.

JOHN E. FRASER, until recently vice-president and general manager of the Otsego & Delaware Telephone Co., at Oneonta, N. Y., died recently in that city, at the age of 44, after a long illness.

New Companies.

IRVINGTON, ALA.—Articles of incorporation have been filed by the Irvington Telephone & Telegraph Co., with $7,500 capital stock. The incorporators are: L. G. Swastwout, W. H. Roberts and Jere Austill.

VISALIA, CAL.—The Woodlake Rural Telephone Co. has been organized here.

CLIFTON, COLO.—The Western Slope Independent Telephone Co. has been organized with $20,000 capital stock.

BEASON, ILL.—The Beason Telephone Co. has been organized with $7,000 capital stock. The incorporators are: J. S. Haller, E. D. Blinn, Jr., and R. O. Haller.

ROSSVILLE, ILL.—The Rossville Telephone Co. has been incorporated with $40,000 capital stock. The incorporators are: Fred L. Draper, Chas. W. Warner and Perry M. Warner.

OCEAN SPRINGS, MISS.—Articles of incorporation have been filed by the Fort Bayou Telephone Co., with $5,000 capital stock. The incorporators are: S. E. Spencer, Ocean Spring; R. M. Spaulding, of Fort Bayou; and Alfred Lewis, of Fort Bayou.

GREENVILLE, N. Y.—The Newry Telephone Co. has been incorporated with a capital stock of $130. The directors are: E. R. Palmer, L. E. Terbush, E. Spaulding, M. J. Dennison, W. S. Lindsley, W. W. Applebee and M. P. Stevens, all of Greenville.

NEWBERN, TENN.—The Rural Telephone Co. has been organized with $5,000 capital stock. The incorporators are: J. H. Patterson, John Jones, R. E. Patterson, John M. Drane and M. E. Vaughan.

CAT SPRING, TEXAS.—The Cat Spring Telephone Co. has been organized here.

MARCUS, WASH.—The Marcus & Kettle Valley Telephone Co. has been organized with $15,000 capital stock. The incorporators are: C. W. Barringer, Glenn Sprague, J. S. Lane and Fred Shriner, all of Marcus.

Construction.

BELLINGHAM, WASH.—The Government Forest Service is planning to build a telephone line from a point on Baker Creek to old Mazama cabin on the slope of Mt. Baker.

Elections.

CRESCENT CITY, ILL.—The Crescent Telephone Co. held its annual meeting and elected the following officers: President, W. H. Whiteside; vice-president, J. M. Martin, Hillsdale; secretary, A. A. Matthews, Erie, and treasurer, E. L. Hanson, Hillsdale.

MCHENRY, ILL.—The stockholders of the McHenry County Independent Telephone Co. have elected the following directors: George Hanly and Frank Barbian, of McHenry; J. N. Goltra, Evanston; F. W. Potter, Chicago, and Frank Hood, San Francisco, Cal.

VOLANT, PA.—At the annual meeting of the Plain Grove Telephone Co. the following directors were elected: Wm. McCune, Chas. H. Turner, O. H. Miles, Manville Foster, N. A. Offutt and Newton Nelson.

DESHLER, NEB.—At the annual meeting of the Deshler Telephone Co., Albert Caughey was re-elected president and H. M. Harms, secretary and treasurer.

Financial.

SILVER LAKE, IND.—The Peoples Mutual Telephone Co. has increased its capital stock from $10,000 to $30,000.

SAGINAW, MICH.—The Valley Home Telephone Co. has been granted permission by the state railroad commission to issue $100,000 preferred stock.

ALBANY, N. Y.—The Public Service Commission has authorized the Walton Peoples' Telephone Co. to issue its 50-year 6 per cent. bonds, payable semi-annually, to the amount of $30,000.

STRINGTOWN, OKLA.—The Citizens' Telephone Co. has increased its capital stock from $2,000 to $5,000.

EPHRATA, PA.—The Denver & Ephrata Telephone & Telegraph Co. has increased its capital stock from $35,000 to $55,000.

KITTANNING, PA.—The Kittanning Telephone Co. has increased its capital stock from $150,000 to $500,000.

NAZARETH, PA.—The Slate Belt Telephone Co. has increased its indebtedness from $50,000 to $55,000.

FREEPORT, PA.—The Freeport Telephone Co. has increased its capital stock from $20,000 to $50,000.

Miscellaneous.

LYNN, IND.—Notice has been filed with the secretary of state that the Lynn Telephone Co. has paid up all indebtedness and dissolved.

GERMANIA, IOWA.—The Kossuth Telephone Co., of this city, has been sold to the Western Electric Telephone Co.

LUCIEN, OKLA.—The Lucien Telephone Co. has been sold to Morlling & Morlling.

BURNET, TEXAS.—The Smart Telephone Co. was sold for $11,000 to A. L. Collins, of San Angelo, by W. E. Howard.

BURNET, TEXAS.—The Smart Telephone Co. has been sold by W. E. Howard to A. L. Collins, of San Angelo, for $11,000. Mr. Collins will extend and improve the system.

FOUNTAIN CITY, WIS.—Bernard Botzet, of this city, has bought the Fountain City Telephone Co., which was formerly owned by F. H. Fiedler and W. F. Mueller.